

AVIATION

The Oldest American Aeronautical Magazine

JULY 11, 1927

Issued Weekly

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Rodman Wanamaker's First "America" Built By Glenn Curtiss in 1914

VOLUME
XXIII

SPECIAL FEATURES

NUMBER
2

AVIATION WEST OF THE ROCKIES
WEATHER BUREAU AID IN OCEAN FLYING
AMERICAN COTTON AND AMERICAN AIRPLANES

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BREEZE FLEXIBLE METAL HOSE

is standard equipment on FOKKER planes

**BYRD'S TRANS ATLANTIC
ARMY TRANS PACIFIC
BYRD'S NORTH POLE**



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An Appreciation

R.A.

We wish to express our admiration and extend our most sincere congratulations to

the army trans-Pacific fliers, Lieutenants Mastland and Hegenberger, for their brilliant flight to Hawaii, the longest over-water flight in the history of aviation — —

the trans-Atlantic fliers, Commander Byrd, Acosta, Noville and Balchen, for their masterly conquest of storms, fogs and darkness in their flight to France — —

the Army and civil organizations whose scientific preparations made these flights possible.

That these great undertakings were accomplished in FOKKER Trimotor land type transport planes, is a source of pride to the manufacturers; but the greater satisfaction lies in the scientific contribution these path-finding flights have made toward the era of inter-continental air transport.

R.A.

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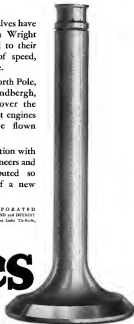
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1927

RD-AUP

Under the worst weather conditions encountered by any of the trans-oceanic fliers, Pioneer Instruments guided Commander Byrd and his crew to France, for nineteen hours out of sight of land or sea and much of the time completely "blind" in rain, fog and clouds.

We congratulate Commander Byrd, Bert Acosta, Lt. Neville and Lt. Balchen on their success. The flight of the "America" was a masterpiece of navigation, pilotage and engineering.

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Newsdealers stocks of AVIATION have been sold out so quickly during recent weeks that many regular news stand purchasers have been unable to obtain their copies.

To those who have complained, we have had to reply, "The edition is sold out," despite the fact that our printing presses are working overtime to supply sufficient copies.

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(Signed) WALKER M. LEVETT CO.

For information, see page 62, July 31, 1937.

On the trans-oceanic planes of Byrd and Maitland the Atlantic Aircraft Corporation, builders of the FOKKER planes, used Magnalite aluminum alloy heat-treated castings.

Wright Aeronautical Corporation, builders of the Whirlwind engines use Magnalite aluminum alloy castings.

The Walker M. Levett Company supplied aluminum alloy heat treated castings for the Douglas "Round the World" planes, the Loening Amphibian planes used on the South American Good Will Flight, the NC-4, Commander Rodger's Hawaiian plane, Byrd's North Pole plane, and more recently the planes of Lindbergh, Chamberlin, Maitland, and Byrd as well as many other companies manufacturing airplane parts and accessories.

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Established 1904



Commander Byrd's famous Polar plane over New York City on its final test flight.

ANOTHER ACHIEVEMENT for DARTMOUTH-TEX

THIS is indeed a season of great achievements for American aviation. Commander Byrd's great flight from New York to France against terrific weather conditions, and the long flight across the Pacific by Lieutenant Mailand and Hegenberger are typical examples of the courage and skill of American aviators and the leadership of American airplane builders.

Dartmouth-Tex new cloth has played an small part in these achievements. The fuselages and tail surfaces of both Commander Byrd's huge plane, and that of Mailand and Hegenberger were covered with Dartmouth-Tex airtight and tapes. The famous Billings monoplane, which holds the world's record for endurance

and distance is covered with the same fabric. In each case it has served its purpose faithfully, and conclusively shown why it has been the leading airtight cloth in America for aviation years.

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Index to Contents

NEWS ARTICLES AND ITEMS

The American Flies Through Fog to France	60
Los Angeles to Make Longer Flight	70
British Flies From Atlantic Flight	70
Weight to Head Model Plane Contest	71
Chicago-Pitts. Mail Run Goes to Booking	71
Revised Washington to Boston Flight	71
Mailand and Hegenberger Fly to Hawaii	72
Standardization Marks Subsidy Tour	75

FEATURES AND DEPARTMENTS

Editorials	67
Byrd and Mailand Plan Alaska to Boston	74
N.A.T. Flies From Over 700,000 Miles	
During First Year of Operation	80
The Matten-Henley Airplane Control	83
Weather Bureau Aid in Ocean Flying	84
Drugs Aircraft Corp. Designs New Plane	87
American Cotton and American Airplane	88
American West of the Rockies	92
Side Steps	100
Foreign Aeronautical News	110
Algorithms and Airways	112

ADVERTISING INDEX	115
WINGS TO FLY	117
AIRPLANE SERVICE DIRECTORY	121-122
CLASSIFIED ADVERTISING	126

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With the Editor

To the general public the trans-oceanic flights have been the most interesting of this year's aeronautical events, but to the commercial pilots who wish to buy planes the Ford Subsidy Tour is of really greater importance. Seeing a flying and is many of the commercial operators who are located on or near the long route of the tour this is the only opportunity of seeing the planes which they wish to purchase. Besides seeing some specific type of plane for their own use, an opportunity of observing the general trend of aeronautical design and the developments which have been made since the previous year.

Every one agrees that the tour is an excellent institution, both for demonstrating the planes and for testing their performance under various conditions and it is unfortunate that so many firms have not gotten this year's models of their planes into production in time to enter them in the contest. The meeting which is to be held after the tour to decide plans for the future will have a difficult and extremely important question to decide when it comes to choosing the time for next year's tour.



Aerial view of Commander Byrd's "America" flying over a vast field (F. R. & Photo)

The America Flies Through Fog to France

Commander Byrd and Companions See No Land or Water for Nineteen Hours and are Completely Lost for Last Five Before Landing 200 Yards Off Shore at Ver-Sar-Mer

FOR THE third time within the short space of six weeks an American made airplane has crossed the waters of the North Atlantic in one continuous flight. This time it was the latest seaplane (Wright Whittaker) Fokker monoplane America, commanded by Commander Richard E. Byrd (last took off from Roosevelt Field, L. I., at 9:54 a. m. June 29 and at 5:30 a. m. (Paris time) July 1, was landed in the sea some 200 yards from shore near Ver-Sar-Mer, France. Accompanying Commander Byrd were Bert Acosta, pilot; Lieut. George G. Goetz, flight engineer; and Bert Barber, relief man. Together the four men had originally set out to cross the Atlantic and land at Le Havre, outside of Paris, but after being in the air for over forty hours, none of which were spent in a fog, out of sight of land or water, and the last five of them being spent groping blindly through pitch darkness over and about the French capital in search of a suitable place to land, they voluntarily ended their trans-Atlantic flight in the waters off the French coast and then made their way ashore by means of a rubber life raft.

According to latest reports the only signal indicated, aside from the steady and shock of the engine's whir, was the twinkling of Bert Acosta's flashlight. But when the quartet arrived in Paris on the following day, after spending a night as guests of the city of Orléans, Acosta and Byrd were crowded

at the American Hospital, and afterwards advised to go to bed in their suite at the Hotel Continental and obtain all the rest possible.

The take off from Roosevelt Field, attended by Acosta, was perfect and according to reports of the four was the total distance of the plane not more than seven miles, or close to 10,000 by most of which was accounted for by the 1,200 psi of gasoline in the tank.

Take Off Made in 48 Seconds

Before taking off Acosta had announced that he would "hold her down" as long as possible. This he did to the letter. As soon as the rope which anchored the tail wheel was cut, the plane started down the runway gathering speed with every revolution of the propeller. After 3,000 feet had been covered the tail could be seen to be off the ground, but instead of trying to clear the wheels Acosta held it down for greater speed and even when it had been cleared the ground he made the plane "cut the grass" before trying to gain height. Rapidly he climbed up and when the great Fokker passed over the spot of the ill-fated Sikorsky crash of last year, it was a good thirty feet in the air.

The plane took thirty-eight seconds to run the 3,200 feet before it got into the air. It is a full load but it had made a

take off in twenty-seven seconds, but this time Acosta had allowed the plane to carry itself into the air.

Once up, Acosta continued across Curtis Field, still making no attempt to force his engine or gas pump altitude. He remained in the seat in the narrowest horizon. Then five minutes later a very wind up from those outside the longer. The America could be seen returning with an escort of nine planes, some of them from Alhambra Field and others carrying my reporters and photographers.

Passes Over Hangar Heading East

The plane by that time had gained an altitude of about 700 feet. The engine still was not turned up high, but seemed to be making the revolution which gave the plane its best cruising speed of about ninety miles an hour. Then wonder Byrd had pointed his plane east as he passed over the hangar. A mile or so away he took an east turn and came and headed for the end of Long Island.

Fairly good weather was met with on the Fokker line up the American coast and a good speed was maintained even with the heavy load aboard. But upon reaching Newfound-land the fog was encountered and from that time until they had nearly reached Europe the days were neither land nor water. So dense was the fog at times that, according to statements of the stream, it was hardly possible to see the tops of the waves.

During the crossing Commander Byrd was unable to make observations in an attempt to find his exact position and the plane ran a compass course far over a theoretical route. At

first the course was set for Paris and soon after that, Anderson showed in. And from that time until they landed in the water the exact position was not known to those on board. More than once they believed themselves to be near, if not directly over their goal, but owing to the thickness of the fog they were unable to pick up any of the signal lights on the ground. And added to this condition was the sudden failure of the radio set.

For hours they drifted about in search of a landing place but it was too dark to tell the nature of the ground below.

Eventually when the fuel tanks were practically dry the men saw the revolving light of a lighthouse and it was decided to make a landing in the water. A navigation flare was dropped but its weak light was little as no use in the landing.

About Halfway at the Controls

Bert Barber was at the controls, having piloted America, who had relieved the plane from the time it took off from Roosevelt Field. As the plane struck the water the sail-cum-canoe was torn off. The impact threw Commander Byrd through a window and into the water, as he was in the cockpit he called the crew of such. If his companions, but arrived to reply owing to their deafness from many hours of the engine's droning.

Finally the four found each other and prepared to go ashore at the rubber life raft. Commander Byrd was the last to leave the plane and he took with him the mail, the part of the ship's log which he was to present to President



Left to right, Bert Acosta, Commander Richard E. Byrd, Lieut. George G. Goetz, and Bert Barber, in front of their intrepid Fokker monoplane America.

Demerger of France, and in many of his shorts and technical notes on the world scene.

Upon reaching the shore they eventually found the light house keeper and two fishermen who helped them find quarters in the little Normandy village.

When at last the trouble was over, the army arrived in Paris they were greeted with enthusiastic reception by the populace. The streets were jammed with cheering thousands who were thankful of their safety and sharing of their courage and perseverance.

As soon as they are physically able to stand it, they will be honored in the French government and the French people.

The numerous meetings of press and newsmen have been limited from all over the world.

Los Angeles to Make Longer Flights

According to a recent oral announcement made by Secretary of Navy, Curtis D. Wilber, the Navy desires, Los Angeles, now undergoing a month's period of overhaul for the primary purpose of repainting her below, will be used in longer flights in the future.

The ship, which under the terms of the Treaty of Versailles of 1920, was to be used only as a commercial ship, has been equipped as a training craft for high-speed development of the Navy. But when flights in Los Angeles would be called upon to make her not as yet been determined, the Secretary stated.

The possibility of a Lockheed, N. J., to Honolulu, Hawaii, flight was discussed orally by the Assistant Secretary of the Navy for Aeronautics, Edward D. Warner. Secretary of the Navy for Aeronautics, Edward D. Warner. Secretary of the Navy for Aeronautics, Edward D. Warner.

A meeting held last week provided especially for the Los Angeles and other lighter-than-air craft at Honolulu, and a view to handle the vessel in construction there.

This flight, if ultimately decided upon by the Navy, would be of approximately 6,000 miles, it was stated at the Department. The distance from Los Angeles to Honolulu is approximately 5,500 miles, but the course that would be selected for such a trip probably would be by way of Port Worth, Tex., and San Diego, Calif., where meeting would have been considered.

The Navy vessel "Pinta," which is equipped with a mooring mast, Secretary Wilber said, has been successful in its mooring tests with the Los Angeles.

In the event the Los Angeles should make the Honolulu flight, the "Pinta" as the opinion of senior officials, would be used to follow her course across the Pacific.

The Los Angeles, which was built in Fredericksburg, Tex., built for the navy, made the long run across the Atlantic in September, N. J., a distance of 5,000 miles.

British Pilots Plan Atlantic Flights

London, England, reports state that two attempts at crossing flying between London and New York will be made this summer by British pilots.

Under sponsorship of "The Westminster Gazette" Capt. J. E. Cunniff, one of Great Britain's most noted aviators, will try off in July, and Capt. Robert S. Macdonald, and Edith C. P. P. Macdonald, both British imperial aviators pilots, will take off the first week in August.

By Empire Countries has completed arrangements for an attempt to become the first ever to cross the Atlantic from England to the United States, and plan to leave Southampton to try to fly in New York by way of Ireland and Newfoundland. This will fly a Dornier-Wal seaplane, an all-metal flying boat designed by the famous German engineer, Herr Dornier. It is propelled by two Napier "Loon" engines mounted in tandem, each furnishing 400 hp.

By Captain Cunniff said to New York is successful he plans to fly back to England after a stop of only eight or ten hours.

Macdonald and Macdonald expect to fly from London to New York, returning there in eight hours and hopping back across

the ocean and into Europe. They have chosen the first week in August for the trip because the weather is generally best at that time. They plan to fly from the Norfolk Airports, near London, to New York and return within eighty hours, that, turning their plane eastward, to fly and the last supply is estimated.

The flight, estimated to cost \$70,000, of which half is already provided, will be made in a 400-hp. Pinta seaplane, then descending the English Channel and taking up a place similar to those used by Lindbergh and Chamberlin.

By General Herve, Air Minister, announced in the House of Commons recently, made the report that no further attempts at a seaplane flight to India can be made until fall.



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Record Washington to Boston Flight

A new record for the record trip flight between Washington, D. C., and Boston, Mass., was recently established by Capt. Allan P. Fugle, Operations officer at the Bureau of Aeronautics, Navy Department. Flying one of the Navy's most modern true airplanes, the "Vought-Curtiss," Lieutenant Fugle made the record trip in the actual flying time of six hours and thirty minutes, which gave an average speed of over 150 m. p. h. for the record trip.

The Vought plane flown by Lieutenant Fugle is a duplicate of the Curtiss model which recently established four new airplane world's records for altitude and speed, all made by U. S. Naval Air Service personnel.

He was accompanied on the record trip by Lieut. Claude George D. Murray, Flight Officer, of the Bureau of Aeronautics.

The Navy has placed an order with the Chase Vought Corporation for a large number of these Curtiss planes. They are equipped with Pratt & Whitney "Wasp" engines. The Curtiss will be used throughout the Naval Air Service, particularly on the new aircraft carriers, U. S. S. Saratoga and U. S. S. Lexington now rapidly nearing completion, and for outlying use on the Navy's battleships and most officers. The Curtiss will replace the Vought V-1s now being actively used by the Navy.

Wright to Head Model Plane Contest

In a recent announcement made by the Playground and Recreation Association it was stated that Orville Wright has been selected to head the Championship of a national model airplane and flying of model airplanes, to be conducted by the association.

The contest was inspired by Col. Lindbergh's flight to Paris, and it has been endorsed by the Assistant Secretary for Aviation of the War, Navy and Commerce Departments.

A series of local competitions will be held on the public playgrounds by Municipal recreation departments, park commissions and other public recreation organizations in 400 cities. One million boys and girls, young men and young women are eligible to compete in these competitions, the winner of which will go to Memphis early in October to win off the field in competition with the National Thermocline Center.

Chicago-Frisco Mail Run Goes to Boeing

At 12:31 a. m. July 1 the Boeing Airplane Co. took over from the Post Office the business of carrying the mail between Chicago and San Francisco.

The Post office department will continue to operate the modern flying between Chicago and New York on one month when it will be turned over to the National Air Transport, Inc.

The Boeing Airplane Co. will operate a fleet of 25 planes on the coast, carrying of sufficient size to transport two passengers and the mail crew. Yesterday the entire air mail personnel of the division, including the pilots and mechanics, will be taken over by the Boeing Company. U. S. Civilian Aeronautics board superintendent of the air and service, assigned a senior position with the Boeing Company with headquarters at Rock Lake, Wis.

English Vesp World's Smallest Plane

What is claimed to be the smallest passenger airplane in the world was exhibited recently at Croydon airport, south-west London, England, after it had completed a flight from Stuttgart.

The plane has a thirty-three-inch wing spread and is twelve feet long. A two-cylinder engine drives it carrying five miles an hour. Its weight without a load is 595 lb. Lady Bader, the English aviator, was the German pilot's first passenger, and experienced delight with the plane. The German pilot said it was intended for sale to Germany.

Art Goebel to Attempt Hawaii Flight

Art Goebel, retail as one of the most capable pilots on the Pacific Coast, will attempt a non-stop flight from San Francisco to Hawaii in an effort to win the \$35,000 Deane Pass. Goebel will use a regular stock Travel Air seaplane powered with a Wright Whirlwind.

2.5 meter. Located and with Goebel in the seaplane is H. C. Lyppard, Southern California representative of the Travel Air Company.

Goebel and Lyppard made a four-day trip to Hawaii in an effort to secure a plane to use in complete for the Deane Pass.

Lyppard, Chief Field, Santa Monica, where Goebel maintains a base, and Lyppard made a four-day trip to Hawaii in an effort to secure a plane to use in complete for the Deane Pass.

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Previous Record to Hawaii Was 75 Hours

According to an statement of the Department of the Navy, the fastest time, before the flight of Lieutenant Harold G. Gurnea, made between the Hawaiian Islands and San Francisco, in any manner of seaplane was made by the latter aviator, who made the run in 75 hr. 40 m. and 40 sec. in 1923. The time of the airplane flight was approximately 75 hr.

The average speed of the Goebel was 47.75 miles an hour, and that of the Army Pilot plane, approximately 90 m. p. h. The Goebel, it was stated at the Department, attended from Lieutenant Harold Gurnea on the Island of Oahu in the "Pinta" light vessel, making the trip from May 5 to 31, 1923.

Only Ten Cent Lindbergh Stamp Issued

In a memorandum to postmasters generally who have sought a supply of two new stamps commemorating the flight of Colonel Lindbergh, Third Assistant Postmaster General, U. S. Representative estimated that the new Lindbergh commemorative stamp is being printed in denominations of ten cents only and would be issued of 100 stamps.



Art C. Goebel



The three engined Fokker Army Transport just off the island on route to Wheeler Field, Hawaii.

Maitland and Hegenberger Fly to Hawaii

Pilots Three Engined Flight Wheelhead Fokker Army Transport From California To Wheeler Field, Hawaii and Set New World's Non-Stop Water Flight Record

AT NINE stations after seven check (Pawlo) took, Tuesday morning, June 25, from Los Angeles, Maitland and Hegenberger started into the air aboard a three engined (Wright Wheelhead) Fokker Army Transport from the runway of the Oakland municipal airport in California and headed west toward the Hawaiian Islands more 3600 miles way. Twenty five hours and fifty minutes later the heavy plane was glided down to a perfect landing at Wheeler Field, Island of Oahu, Hawaii. This for the first time in history the Americans mainland and the Hawaiian Island were successfully connected by air, and added to that was the establishment of a new world's record for non-stop distance flying over open water.

Competitor Forced to Return

A short time after Maitland and Hegenberger had taken the air at Oakland two civilian aviators, Ewell L. Smith and Charles H. Carter took off in a single engined (Wright Wheelhead) Travel Air monoplane in an attempt to beat the Army flight across the Pacific waters, but due to a minor engine fault the pilot was forced to return to the airport and give up his failed attempt.

The start by Maitland and Hegenberger provided with military presence. There was no time for stamping demon-

stration. The large crowd that had gathered to witness the take off scattered itself in an orderly manner, and new sections of the fleet, accompanied by Maj. Gen. Moore M. Patrick, chief of Army Air Corps, had arrived at the field the plane was in the air and on its way.

Take Off Run of 6000 Ft.

The runway at the Oakland field is 7000 feet long and according to official Army observation, the Fokker took the air at approximately 6300 feet. Only three persons who were stationed near the end of the runway saw the plane leap the ground because of the heavy clouds of dust stirred up by its propeller and which completely hid the plane.

Onboard, outside and winging about the field, were several Army service planes. As soon as the Fokker cleared the ground these escort machines straightened out in a orderly course and fell in formation behind as Lieutenant Maitland plotted it over San Francisco Bay, heading toward the Golden Gate.

The plane climbed rapidly from the field and by the time it reached the Golden Gate it was 3000 feet high.

Immediately as receipt that the plane had taken off ships on the Pacific were directed wireless messages to keep a sharp watch and report its course by radio. The radio beacon station

created at the Presidio of San Francisco especially for the flight, was expected to operate in the flight started.

The next radio station at San Francisco received first word of the failure after it left the coast line. A message from the Monterey American Legion, 300 miles off shore, reported the plane crashing at 3 A. M. A later report was that the Fokker was against 500 miles out at sea. From then on until the three more miles five hours of their dramatic rescue radio messages received reports of their being sighted.

The radio signal coming back from Maui, where the weather had hoped would guide them along their way, was available only during the first hour of their flight.

"When the beacon failed to register we decided to get altitude and consult the stars," Hegenberger is reported to have said. "We went to the 30000-foot level and checked our position. While flying at that altitude we noticed a break in one of the motors, so we gradually descended to 5000 feet, where the motor adjusted itself, and we returned to the higher level without difficulty, where we continued until this morning."

Local Sighted After 23 Hours

According to the mission that was the only message trouble of any consequence they encountered. They explained that a following wind accompanied them virtually all the way, and except for a slight run square, good weather was encountered. Local was first picked up after they had been in the air for twenty-three hours. It was the Island of Kauai, northwest of Oahu Island, of the Hawaiian group, on which they landed.

The end of the flight was dramatic. A large mass of Americans and sailors had awaited the plane throughout the night.



(P & Photo)

General French taking Lieutenant Maitland and Hegenberger aviators for below the first of

and, at daylight came out on word from them, had gone real close with fear that they might have fallen in the sea. Army aviators were sent out to welcome them, but they found no trace of them.

Reluctantly the skies, which had been overcast closed and a few moments later the great Fokker plane came down successfully

into view. As the plane rolled the field, shots came from the crowd, growing louder in the direction described in a perfect landing.

Maj. Gen. Edward M. Lewis, commanding officer of the Hawaiian Department, extended the official greeting and after a brief welcome took on the field the three men to the officers' lounge at the post. Here they were given coffee and allowed to prepare for the long ride into Honolulu.

Hawaiian Flies in Aviation Since 1917

Lieutenants Maitland and Hegenberger, pilot and navigator of the three engined Army Fokker monoplane that flew from California to Hawaii, have been closely connected with aviation since 1917.

Both enlisted in the aviation section of the Signal Corps in 1917, when the United States entered the war, Maitland is April and his companion in September.

With his training period behind him, Maitland was assigned to be reconnoiterer and in March, 1923, he took the first world speed record with a 2447-mile-a-hour flight in a Curtiss over a one kilometer course at Willow Wright Field, Ohio. He has flown nearly every type of plane and is known as one of the Army's best pilots.

Hegenberger, who studied engineering before the war, transferred to the aviation phase of his career and from July, 1918, to September, 1923, was chief of the instrument and navigation branch of the Engineering Division at McCook Field, Ohio. On Army records he is listed as one of the outstanding aviators in the service.

Born in Milwaukee in 1903, Maitland had his first flying lessons at Rich Field, Wren, Tex., being commissioned as a reserve aviator in May, 1918. Thereafter he served at Camp Dick, Illinois; Langley Field, Va., and Yulafsky Field, Tex., in the Hawaiian Islands and Selfing Field, Washington. O. C. at Wright Field, Ohio, upon the appointment of Assistant Secretary Division to handle Army air activities he was made Assistant Executive in his Division's office.

Hegenberger was born in Kootenai in 1905. He received their training at Ellington Field, Houston, Tex., winning a reserve commission in April, 1925. After service at Ellington Field and Camp Dick, he passed the observation and army tests and then took a special engineering course at the Massachusetts Institute of Technology.

He became chief of the instrument and navigation branch McCook Field after having served in the Hawaiian Islands and, like Maitland, served also in the Hawaiian Islands. After his return to McCook Field he made a number of cross country flights, entirely through fog or clouds, in order to test the work under conditions in a navigation aid.

Drouhin Expected to Hop Off Soon

Reports from French state that the time is near when Yves Drouhin, famous French aviator, will take his Farman plane "Blue Bird" into the air in an attempt to make a non-stop Paris to New York flight.

The plane is now completely equipped and in its latest test only carried with a load one third of that required for the trans-Atlantic trip.

Mr. Drouhin will be accompanied by Navy Lieutenant Le Borg, who will act as navigator and also as scoring M. Drouhin, in all the experiments.

The Drouhin expedition in many ways is comparable to that of Commander Ford. The plane's cruising 1100-horsepower is rather in excess of 5700 3100 horsepower, while the plane, passengers and fuel supplies will total at the take-off. However, regarding the height of the journey will hold 3500 ft. of pressure, sufficient for a non-stop flight of 7500 kilometers (about 4500 miles).

Like the American, the Blue Bird has a wingless which will give the firm the advantage of comfort possible.

It is possible, after the flight from Paris to New York, to return by sea or attempt to make a non-stop trans-Atlantic record by continuing past Paris over Europe.

Byrd and Maitland Planes Alike in Design

Both Were Built in a Series of Six Transports by the Atlantic Aircraft Corp., and Differ From Each Other in the Installation of Special Fuel Tanks and Navigating Equipment

THE THREE engines (Wright Wheland) Fokker monoplane used by Commander Byrd and Lieutenant Maitland on their transatlantic flight are perfectly identical structurally. Both planes were built in a series of six transport planes by the Atlantic Aircraft Corp., at Hawthorne Heights, N. J. Three of the six were Army transports and two of these attracted considerable attention when they were used by American Secretary of War F. Trines Davies, General F. J. Paulk, General G. H. B. Porter, Admiral W. A. Glass, and others, in the recent war maneuvers in Texas. The other three planes were constructed as commercial transports and two were delivered to the Columbia Air Transport, Inc., for its mail and passenger service between New York and Boston. The third was converted into the trans-Atlantic plane "America."

Fixed With Wings of 730 Sq. Ft.

Commander Byrd and Lieutenant Maitland's planes differ from the others first in that they are fixed with wings of 730 sq. ft. instead of the usual 617 mounted wing of 630 sq. ft. And they differ from each other in the installation of special fuel tanks and long distance navigation equipment. In Byrd's plane the installation for long distance flying was made at the Atlantic Aircraft Corp. while the equipment in the Army transport was installed at the Engineering Division, Army Air Corps, at McCook Field, Dayton, O. The Army transport was equipped to carry 1,840 gal. of gasoline or compared with approximately 1,200 gal. which were carried in the America. The Army transport's engines were not cooled, thus making the best speed possible less than that of the America.

The entire series of six transports differ from the usual F-7 Fokker in that the pilot's cockpit is moved one bay forward, placing it in front of the wing instead of beneath. The cockpit is covered with glass, thus affording an excellent view ahead and to both sides, the glass roof of the top bay is



Side view of the Columbia Air Transport Fokker monoplane "America."

cleared back making use of stand up, and dual side by side control in front. Under the seats in Byrd's plane, there is a 70 gal. oil tank while behind each of the outboard engines there is an oil tank of 15 gal. capacity. The oil tanks were completely covered by the fuselage fuel, though in this case the fuel amount of oil carried was 28 gal.

Ahead the American and immediately behind the cockpit is a compartment containing the radio apparatus. It is 4 ft. long and 5½ ft. wide, while in Maitland's plane this forward section is all one compartment, 8 ft. by 6 ft., and the extra gasoline tanks in the forward part. At the left in the radio



Side view of the three engine Fokker monoplane "America" in the company.



Front quarter view of the American plane with Lieutenant Maitland in the cockpit.

equipment, the standard Army 808 135 wt. The receiver is above and the transmitter is below a shelf on which are the hand set and transmitting key. On the right side is another and larger shelf serving as a table at which the navigator can make his computations. The Equipment Branch of the Marine Division, of which Lieutenant Engstrom is acting chief, obtained data of extreme value in the test of this equipment, and for the purpose of checking and comparing it installed a sensitive special compass of the magnetic type. A hole or trap door, closed by hookless fasteners, is provided in the roof of the cabin through which section and determination of drift are made. The navigator stands on a small table with his head and shoulders above the cabin, and can make his observations with his wings of vision unimpeded by structural members of the airplane. If it is desired to make constant observations from within the cabin, special windows of specially tinted glass are provided near the roof.

Byrd Plane Has 600 Gal. Fuel Tank

The interior of Commander Byrd's plane is divided by an 800 gal. cylindrical brass tank suspended in the cabin. This tank is in addition to the four 82 gal. tanks installed in the wing. In front of the tank, and at each side of the radio compartment, are three doors closed by "Bogert" fasteners. The navigation housing, which normally carries the controls, gasoline tank, electrical wiring, etc., to the side entrance is removed so as to form a structure on which a man can rest and to the side engine to make adjustments while in flight. Both controls are of metal control so as to add lift instead of being substance offering resistance. A belt suspended under the side hatch used for window clearance is provided to allow the crew making engine adjustments the use of both hands and support against the structure.

The main navigation compartment arranged behind the main tank, contains the main tanks with the compass mounted in the center, the controls for the north indicator compass and the various other instruments, including altimeter, air speed, indicator etc. In order to be able to enter without difficulty, there is a trap door in the top of the fuselage just behind the wing. Below the trap door is a small rug which the navigator can use for taking his observations. The draft indicator is mounted on a sliding door on the floor so that the hole can be closed when not in use.

The main tank, in addition to one side making a provision

before and in the right hand corner of the fuselage, just large enough for a man to crawl through from the forward to the rear compartment. The gasoline is fed from this main tank to the wing tanks by an engine pump which is duplicated, in case of failure, by a hand operated wheel pump. Commander Byrd carried an additional gasoline supply of 135 gal. in five gallon tins which were emptied into the main tank by hand and the same was thrown overboard. Probably the most important feature of the tank installation is its dump valve. There can be little doubt that the trans-Atlantic flight



The main fuel tank of the America.

with the dump valve holds the way to the ultimate admission of the quantity of pressure. So long as the valve is kept open, the pressure, etc., by air. If one of the motors stops and the plate is at that time too highly loaded to continue flight on two motors, the dump valve permits the dropper of sufficient pressure to follow the total weight so that on release the light will two motors is possible.

The Pioneer with anterior compass is mounted on top of the fuselage after the wing. After the navigator's cabin the



Interior view of the Army Transport showing complete instruments and the controls in the pilot's cockpit.

at the top of the fuselage is a compartment where the food, emergency rescue, subsistence food, farm, spare equipment, etc. are stored. It is accessible through a rib panel at the top of the fuselage. In addition there is an air tank which contains externally of a small propeller and venturi tube as arranged that at every six miles, the indicator moves one unit. It is mounted on the right wing of the Pioneer.



Controls and instrument board of Ryan's biplane, Pioneer.

estimated has been in operation for over a year on the Pioneer.

The radio set has a range of 5,000 mi. when the antenna is hoisted but on the surface with a kite aerial, the range is considerably reduced. The apparatus was designed by J. H. Hyland and M. P. Hansen of the Navy Department and was built by the Albee P. Corbett Co.

As covered with standard Fokker practice, the wing is of

sternward, leeward cantilever construction and is devoid of internal bracing wires. It is a very simple construction and contains mostly of two large box spars and wooden ribs covered by plywood. The upper and lower horizontal members of the spars are laminated and taper of the wing (at center) is obtained by reducing the number of laminations towards the tip. The ribs are also constructed of plywood with solid air struts, and the construction also one of solid section while the others are lightening holes.

The plywood covering used on most Fokker wings adds greatly to the inherent strength of the wing as it is glued and nailed to the structure, thus giving support in all directions in any manner which may come in contact with the ground or other parts, in the event of a collision, so that the damage is minimized and localized. The portion of the wing, as on all Fokker planes, is high and is well faired into the lines of the fuselage.

The steel tube fuselage with welded joints and triangulated engine mounting is of standard Fokker construction, a development which was made practical by Mr. Fokker some



Mechanics working on fuselage in the California at Boston.

twelve years ago. The rear part of the fuselage is faired by the well-known Fokker double plane wing, a form of bracing which is both light in weight and easy to brace up after a crash. The fuselage is faired covered.

The general specifications of the two planes are as follows:

Wright plane empty..... 5,600 lb.
 Loaded..... 5,900 lb.
 Overall (approximate)..... 1,200 sq.
 Max. load..... 1,400 sq.
 Wings at take off (in case of one be detached)..... 14,500 lb.
 Max. load..... 13,000 lb.
 General dimensions (both planes):
 Span..... 71 ft. 2 in.
 Chord (at fuselage)..... 13 ft. 5 in.
 at tip..... 7 ft. 5 in.
 Length over all..... 45 ft. 1 in.
 Height over all..... 18 ft. 8 in.
 Wing area..... 736 sq. ft.

In recent tests made by the Army Air Corps it was found that the Modified plane sustained an altitude of 4,300 ft. on two engines with a total loaded weight of 11,500 lb. In the event of engine trouble the dump valve, it should be possible to reach land from any part of the ocean after the failure of one engine.

Standardization Marks Reliability Tour

Twelve Out Fourteen Entrants Have Wright Wheelwheels And Wheel Brakes, While All Are Using Metal Propellers

THE WORLD standardization strikes the keynote of the Third National Airplane Reliability Tour which started from the Ford Airport at Beverly, Mass., on Monday June 27. This third tour is not a potential demonstration of the aerial progress made in mass production of airplanes by numerous companies, but chiefly points to the achievement in standardization in purely commercial aircraft.

To the casual observer it is apparent that there is almost a complete sameness of the assembled powerplants, wheel landing, modern aerodynamic instruments in both the enclosed cabin and open cockpit monoplane and biplane types. Out of the fourteen entrants twelve are powered with the Wright "Whitcomb" 200 horsepower enclosed motors, twelve are also equipped with landing gear, and every participant is using a metal propeller. The planes are almost evenly divided between open and open types. With the exception of Hamilton and the Ford planes which are of complete construction all of the monoplane are extremely level and of the closed cabin type while all the open cabin planes are biplanes. The Ford and the Wright No. 15 are the only closed cabin biplanes.

The various standardization marks the first time since the speed course and is also carrying a very large load in that it has the largest figures of merit of the contestants. A feature

of the Pioneer which can not be overlooked is the excellent view from the cabin of the plane.

From the door in the rear of the cabin, entirely shielding the forward part of the fuselage is one standard window, broken only by four structural bracing members, and when in flight there is almost complete visibility of the entire landscape ahead.

Hamilton An Inverting Design

The Hamilton all metal monoplane is one of the most original and interesting planes in the tour. It is a full scale construction with the wing built into the upper part of the fuselage. The passengers look out through circular portholes in the lower side of the wing while the pilot sits in a separate open cockpit directly behind the engine and gets excellent visibility both forward and to the rear. The construction of the plane is excellent and it is evidently ruggedly built for it has already proved much rough work.

The Ryan biplane which is the only entry from the West Coast has almost attracted attention due to its bright coloring. It is painted black and gold and is very sporting looking. The plane is a very distinct advance over the Ryan plane which



General view of the arrival of the Ford Reliability Tour at the East Boston Airport, Boston, Mass.

N. A. T. Planes Flown Over 700,000 Miles During First Year of Operation

Company's Pilots Complete 95.8% of Mileage Scheduled Without Injury or the Loss of a Single Piece of Mail

ON MAY 12, 1927, National Air Transport, Inc., completed its first year's operation of the Chicago-Dallas air mail line. The company's planes flew 700,000 miles on scheduled flights, averaged 187,000 ft. of mail and completed 95.8 per cent of the mileage scheduled. During this time no one was injured and not a single piece of mail was lost. This speaks highly not only for the pilots and the equipment but for the efficiency of the ground organization.

The distance between Chicago and Dallas is 1,090 miles and eight subsidiary stops are required, the schedule being as follows:

North		South
Arr. 7:00 p.m.	Chicago	De. 5:30 a.m.
Arr. 9:35 p.m.	Indianapolis	De. 7:30 a.m.
Ar. 1:40 p.m.	St. Joseph	De. 10:00 a.m.
Ar. 1:55 p.m.	Kansas City	De. 11:30 a.m.
Ar. 3:15 p.m.	Wichita	De. 1:35 p.m.
Ar. 3:30 p.m.	Fort Worth	De. 2:00 p.m.
Ar. 4:45 a.m.	Oklahoma City	De. 3:05 p.m.
Ar. 5:15 a.m.	Fort Worth	De. 3:35 p.m.
Ar. 7:45 a.m.	Dallas	Arr. 9:00 p.m.

The country flown over is for the most part fairly level and fog conditions are probably better than in the Eastern States, but violent winds and sudden changes in temperature are frequent.

Chief Paul Henderson, formerly second assistant postmaster general in charge of air work, is vice president and general manager of the company. Lester D. Seymour is the chief engineer and E. W. Ireland is the traffic manager. E. P. Bell heads the pilots and has the title of manager of operations. He has nine pilots under him. They are: D. A. Ashen,

Harbert L. Knudsen, Richard L. Dohm, Wayne G. Merrill, Edmund Morrison, Lawrence H. Gorman, Paul E. Johnson, Robert H. Felt and George Glasgow.

The annual schedule of flights for a pilot is 100 hours on the southern end of the line and 50 on the northern end. Each pilot has a plane assigned to him following the provision established by the air mail. The total personnel of the company including those at the Chicago office is fifty-five people.

The company originally started with six "Curtiss Express". These planes were designed and built by the Curtiss Aeroplane & Motor Co., Inc., especially for air mail use. They are equipped with Liberty engines and have a mail capacity of 2000 lb. The construction of the planes is extremely rugged and they have required comparatively little maintenance. Some difficulty has, however, been experienced in the maintenance of the Liberty engines. Four other planes were acquired by the company to replace and for experimental purposes. One was a modified B. H. one an Aerial Service "Mercury," a Travel Air biplane and a Ford three-oxagonal plane, both the latter planes being equipped with Wright Whirlwind engines. A five-oxagonal four of the planes in the Kansas City hangar, otherwise all the original equipment is still in operation.

The N. A. T. has recently placed an order for eight Travel Air biplanes, three of which have already been delivered. These are powered with Wright Whirlwind engines.

The flying fields used are municipally owned and the N. A. T. has been allowed the use of the fields without charge. Hangarage here has been constructed either by the municipalities or by the company at Indian, St. Joseph, Kansas City, Wichita, Oklahoma City and Dallas, and the N. A. T. allowed to use these rent free. In Chicago the Air Mail Self at Hawthorn is used. A hangar has been built by the N. A. T. on the



New Travel Air biplane (Wright Whirlwind) used by the National Air Transport Inc. on the Chicago-Dallas run.



Current planes passing over N. A. T. hangar. Note wing markings and running lights.

five new Chicago municipal field and no more as this field is completed it will be the Chicago terminal.

The engine repair shop at St. Joseph is located in a wood and metal building fully equipped with the latest hand and machine tools required for the work in hand. In addition, a complete test stand is provided when all critical jobs have completed. A skeletonized propeller stand is used to absorb the power in this installation and permanently located collection instruments, fuel tanks, radiators, etc., are provided to finish jobs and under uniform preparation for engine testing.

Planes Parked in Six Minutes

Fueling arrangements along the line include underground tanks at all stations, mobile fueling trucks at terminal stations and overhead gravity tanks at intermediate fueling stops. All gasoline supply equipment used for filling airplanes tanks is of large capacity units, which provide for rapid fueling. As an example, the complete operation of filling with oil, gasoline and water, including the changing of cargo, requires as an average of 5 to 6 minutes only at intermediate stations. The fueling trucks, provided with an ingenious demountable platform are available for use on ordinary tracks where not it is used for fueling purposes. The platform on which is mounted of the tanks, etc., may be rolled off the track by one man with barbs provided for the purpose in a few minutes.

Night flying equipment on the airplanes consists of three powerful landing lights mounted on one either right and left wings, running lights in compliance with the air commerce law and two parabolic beam which can be aimed separately for illumination of a large amount of area in case it is necessary to make a forced landing at night. These beams, burning for 375 to 4 miles at their best focus supported by a

parabolic, add greatly to the safety at night flying. Of course, all instruments are of the latest and best type and in addition the instrument board is extremely lighted. Fuel compartments are provided with automatic liquid level gauges. For mail collection services are carried in all planes. Radio has not yet been installed but work now in progress indicates that such communication systems will soon be a part of the equipment.

To provide protection for pilots in case of emergency all are required to wear standard Army parachutes, such as have been successfully used in the past year or two.

To provide for the comfort and efficiency of passengers working on planes in cold weather all hangars north of and including Kansas City are equipped with suitable heating plants.

Ground facilities include not only those things mentioned but also approximately 500 miles of roads leading provided jointly by the Department of Commerce, the National Air Transport, and the various municipalities through which the line passes. This equipment consists of 24 in. revolving lanterns, 3.0 A. gas "flashers", emergency field lanterns, lights, obstruction lights and illuminated wind cones or direction indicators. The 30 in. lanterns are placed approximately two miles apart and the emergency field lanterns spaced at three mile intervals. All left lanterns, radio masts, pole flash, etc., which were added to hangars at night when the National Air Transport was started with obstruction lights and the flashers outlined by a series of white boundary lights. The "flashers" are placed every two miles between the 30 in. lanterns and on both of the ends where normally had neither one.

Eight pilots are normally employed in the operation of the route. They fly two days and then alternate after two days

Weather Bureau Aid in Ocean Flying

Upper Air Charts Furnished by the U. S. Weather Bureau do much to Enable The Trans-Oceanic Airmen to Plot His Course and Avoid Bad Conditions

By DOUGLAS W. OLEPHANE

SO ACCURATE have predictions concerning the weather become, that today a flyer may set out on a flight of 3,500 miles across the ocean, and be fairly certain that he will encounter no weather condition on his course that might seriously affect the success of the flight. Very seldom are the conditions on such a long flight all throughout, but by following the upper air charts furnished by the United States Weather Bureau the navigator may plot his course so as to fly over, under, or around any conditions that might force the plane to land in bad spots.

Colonel Lindbergh could not attempt the flight until the Weather Bureau, after having used every resource at its command of its thousands of stations, had secured him that he would have favorable conditions over most of his course, and had given him charts to enable him to avoid the many minor disturbances he would expect along the Atlantic coast.

Colonel Lindbergh started his flight knowing the Bureau advised conditions would be ideal over the entire course. However, favorable weather at the end of the flight was deemed more important than the best conditions along the Atlantic coast. The Bureau predicted hot, dry, and quiet air mass along the coast to Newfoundland, but the charts showing conditions at various altitudes enabled Colonel Lindbergh to plot his altitude to obtain the best

flying conditions under the circumstances. He considered the top and next closest to the next plane altitude advised by the Weather Bureau. In fact, one of the first aviation writers by Lindbergh after his landing in Paris he says that he had almost decided to attempt to fly over the coast of Newfoundland. However, he finally decided to give his flight for that day an altitude of 10,000 feet, and to avoid the heavy mist off the coast of Newfoundland. However, he finally decided to give his flight for that day an altitude of 10,000 feet, and to avoid the heavy mist off the coast of Newfoundland. However, he finally decided to give his flight for that day an altitude of 10,000 feet, and to avoid the heavy mist off the coast of Newfoundland.



Charles F. Marvin, chief of the U. S. Weather Bureau, Washington, D. C.

conditions of favorable weather on the rest of the flight. It is no easy matter to gather data concerning any condition miles above a large expanse of water scarcely touched by the men. Intransigent coast. It was a task that took years of preparation, hours of concentrated overtime effort on the part of some of the Bureau's most trusted employees. To enable flyers to have weather information, the accuracy of which may mean life or death, Professor Charles F. Marvin, chief of the Weather Bureau, and Charles L. Melick, chief forecaster, as well as scores of other employees have spent practically their whole lives in studying atmospheric conditions.

Predicting the many elements that enter into safe flying miles above the ground is a far more difficult task than forecasting the weather on the ground. Especially is this true over the ocean, where so many Weather Bureau ships have yet been established. Transoceanic flyers take the more direct northern route that is made for storms at this season as much as the sea.

Aviators now realize that most is a trained machine, the thing of such importance in any long flight is to have the latest detailed information on exactly what conditions will be met with at all points along the route.

210 First Class Observations

To make "Upper Air Charts" in the prediction concerning wind, temperature, humidity, and visibility, are added, the Bureau has established 210 first class weather observation in all parts of the United States and the adjoining possessions. These stations are manned by a full-time force of men are to fifteen men each, fully equipped with the latest scientific devices for measuring temperature, wind direction, velocity, precipitation, clouds, and the state of the weather in general. In addition the Bureau maintains thousands of second class stations that are not as fully equipped and manned by part-time employees. Reports are received from all these stations twice a day at the central office in Washington. Each station receives the reports of all other stations in its district, and is thus equipped to give the latest information for its district at a moment's notice. Each station makes complete charts of its district as the

information is received, and these are mailed, sent by special messenger, telephoned, or wired to the various subdivisions. Each such district has arrangements to make its own direct reports, and general reports for the whole country are sent by radio direct from the Weather Bureau headquarters twice a day.

In addition to its own stations the Bureau receives detailed reports from an average of twenty stations in Europe a day, including Gibraltar, Paris, Stockholm, Vienna, Copenhagen, and London. Beyond a few stations in Asia are now in operation on London, Amsterdam, the Dutch coast, Tokyo, and the Azores. However, the nearest land stations to the ocean today are at the Azores Islands and the Azores. Both of these islands are in the middle of the ocean. Far from the Weather Bureau has been the importance of obtaining reports and reliable reports from the large transatlantic steamships. All shipping boats are required to make complete daily weather reports but previous to the demand for the radio for other purposes often would go by without sending a single report. Now, since the weather is the most important factor in the success of the voyage, the Weather Bureau and the business of the ocean to have all steamers' sailing routes near that to be taken by the flyers report the weather around twice a day. Because of the nature of the flights, from ten to thirty reports were received a day during the week preceding the two transatlantic flights.

From the reports of the Bureau's own land stations the forecasters were able to make charts of the upper air over the Atlantic coast and from the information received from abroad they made charts of the conditions to be found over England, Ireland, and France. From the reports received from the steamers the experts would chart fairly accurately the conditions to be met with on every such flight.

Five Key Observation Stations

It is a well known fact to anyone that conditions on the ground may be very poor but when the flyer gets thousands of feet into the air he may run into a serious storm that could not be predicted with ordinary land instruments. To secure data on conditions in the air the Weather Bureau has established thirty-five balloon stations, while the Army and Navy maintain others. These a few men fly balloons in to know from each of these stations. By releasing them with hydrogen the rate of ascent is known in advance, and by taking sights every few seconds on the balloon the direction and velocity of the wind at various altitudes can be determined. These balloons have been known to go as high as thirteen miles, but for general working purposes they reach from one to seven miles before they go out of sight of the observer. This information is then plotted and the direction and force of the wind at eight different altitudes is made into charts for each section of the country.

Five kite observation stations have also been established. The kite line and a very similar to the one used until they began to fly, only much larger, and instead of a string

the Bureau uses a very fine piano wire. The kite carries automatic instruments which make a complete record of the temperature, moisture, and wind direction and velocity at the different altitudes. However, the kite is not as reliable as the balloon, as it cannot be used when there is little ground wind, or it runs on other bad weather. Experiments are now being made with balloons carrying complete recording instruments.

With the information obtained from the Bureau's own stations supplied with the obtained from transatlantic vessels, Canada, Ireland and European observations, a fairly accurate chart can be made of weather conditions along the entire Atlantic route.

Pilot Must Know Conditions at Hop Off

When a flyer hops off for a long flight there are seven things that he must know about weather conditions along his route. First is to know if there is any probability of severe storms along his route. For instance, are no conditions so that they can easily be seen in the air. However, with proper weather data the flyer can plot his course so as to avoid any serious disturbances by flying over, under, or around the storm centers. So expert here the air and from before in plotting their course in accordance with the weather data that they surely are not a slight suspicion of air disturbances. Of most importance comes the visibility and what is called ceiling. Both conditions refer to reports for the plane to fly low. A low ceiling means that heavy clouds and fog banks are near the earth. Many flyers will not attempt a flight when the ceiling is under a thousand feet. To keep within range of light, ships or other land marks, the flyer must keep under the ceiling, and if it is very low he will not have much altitude to make a landing plane in case of trouble. The weather reports also give the distance in miles of which a flyer can pick up his land marks. Wind direction, and velocity are most important for the flyer to know especially when he cannot keep within



Roof of Weather Bureau office on top of the Whitehall Building, New York City



Lindbergh looking at the pilot before

sight of fixed landmarks. Regardless of how expert a flyer is, he must always allow for a certain amount of drift from his course, but unless he knows the direction and approximate velocity of the wind he cannot tell what sideways he is making. Extremely low or high temperatures affect the operation of the motor, and often adjustments must be made to allow for the temperature predicted along the route. The humidity and precipitation problems will develop for, say, rain or clouds. "You have to act as a blindfold over the water and as a heavy fog the aviator cannot see even the strongest lights on the ground. Colonel Lindbergh was once forced to jump from his air mail plane after his engine gave out because he could see nothing beneath him.

There's a day the Weather Bureau is Washington receives from each of its stations a report similar to this:

"Second flight today says "

"When translated from the code used to save time and were changed the message contains the following information:

"Perry, 6000 ft. on level barometer 30.30, current temperature 51, wind direction north, weather cloudy, maximum temperature 70, wind velocity 4 miles per hour, precipitation 0 times."

Station having balloons or kite equipment used much more detailed data.

All of this information is sent to every flying field in the country from a day, and is available to any person who desires it by calling either the Washington headquarters or

New York office received the reports to enable the officials to make the weather predictions and charts necessary to the success of the transatlantic flights.

Considerable interest has been aroused at the Washington headquarters by the recent suggestion made by Commander Byrd that the entire report will eventually be used for transatlantic flights. Chief Forecaster Mitchell points out that this will be practically impossible and that weather stations are established north of the Arctic Circle. On every continent there is a number of stations near the Arctic region except on the North American continent where we have not a single station within thousands of miles of the North Pole. There is scarcely a single station north of the densely populated region where the Canadian border, and very few in Alaska. Officials of the Weather Bureau believe that such polar flights will be well within the range of possibility when more complete weather data is available on that station.

No Ships With Balloon Equipment

Colonel Lindbergh has repeatedly suggested that before we can establish regular transatlantic air service we will have to establish ships at regular intervals across the ocean to provide weather information, supplies and to act as emergency bases. At the present time there are no vessels having balloon observation equipment, so that it is practically impossible to predict flying conditions over the Atlantic with anything like the accuracy that predictions can be made on land. With a few such vessels anchored at regular intervals taking regular observations, Weather Bureau officials predict that flights can be made with the same safety as can be made overland. Such stations would enable the flyer to avoid any adverse storms that might interfere with the successful completion of the flight.

In spite of the many handings the Weather Bureau must work under in supplying flying weather at sea, the reports of the two recent transatlantic flights indicate that the Bureau must work almost exactly the weather predicted by the Bureau, and from the advance reports was able to avoid the adverse disturbances directly in their normal path.

"If I just did what we are doing for thousands of people daily," said Chief Forecaster Mitchell in discussing the Weather Bureau's contribution to the first solo ship trans-Atlantic flight. "On a few minutes' notice we can furnish the same information to any flyer if we are put under observation from ships at sea."

Phamphlet On Plane Finishing Methods

The study of studies and protective coating has always been of great interest to aircraft constructors. It comes through many experiments that a different method of preparing a surface before coating it with a protective finish. There seems to be again no many methods of applying this protective coating. Berry Brothers, Inc., of Detroit, Mich., manufacturers of varnishes, stains, lacquers, dyes and solvents, have prepared a pamphlet describing the most successful methods followed in the finishing departments of commercial aircraft concerns. This pamphlet set of specifications was prepared at the highest of aircraft construction concerns, who had a very definite need for information at this time.

The pamphlet includes detailed information for preparing and finishing steel tubing, wood, rivet, spin, exterior metal surfaces, fabric, portions, exterior and interior parts of engine fuel tanks, instrument boards, plywood, etc. It is intended for use so that from time to time additional sheets of data on the most recent developments may be inserted. The pamphlet is entitled "Specifications for Finishing Aircraft."

Driggs Aircraft Corp. Designs New Plane

Combination of Light Weight and Stability Makes For Easy Handling by Pilots of Limited Experience

DESIGNED to offer to the flying enthusiast the greatest performance at the most conservative cost, and with unusual combination given to every inch, structurally and aerodynamically, featuring unusual curves, the new Driggs Dart II, lightweight product of the Driggs Aircraft Corporation of Lansing, Michigan, is rapidly gaining favor upon the market as one of the most practical planes in the field.

The Driggs Dart II was designed by Ivan H. Driggs, possess abundant engineering and vice-president and general manager of the new corporation. Mr. Driggs is well-known aircraft craftsman in connection with the design and construction of the Driggs Dart I which made a record flight from Dayton to Washington and to Philadelphia through severe adverse storms which were considered over the Allegheny mountains, the most dreaded region in the country. But satisfied with this performance, Mr. Driggs has now designed the second Dart which is superior to the early ship, not only in design, but in performance as well.

The new plane is placed in a class by itself in its appeal to the prospective purchaser of aircraft through the combination of light weight and inherent stability. The factor alone is sufficient to impress upon the person viewing the ship its sense that it may be handled very easily by anyone with comparatively limited training and experience.

Specifications of the Driggs Dart II are:

DIMENSIONS	
Span (upper)	25 ft.
Span (lower)	22 ft.
Length (over all)	18 ft.
Height	6 ft. 5 in.
WEIGHTS	
Empty wing	104 lb.
Empty wing	40 lb.
Total wing area	140 sq. ft.
Stabilizer	5 lb.
Stabilizer	7 lb.
Stabilizer	9 lb.
Fin	2 lb.
Aluminum	14 lb.
WEIGHTS	
Empty	308 lb.
Empty and full	400 lb.
Powered	300 lb.
Total weight	728 lb.

Power loading 20 lbs. per sq. ft. || Wing loading | 51 lbs. per sq. ft. |
Engine, Anson, 8 cyl.	40 hp. at 1800 r.p.m.
Wing section	11 ft. 7 in.
Stability factor to Department of Commerce	

PERFORMANCE

High Speed 50 mi. per hr. || Maximum speed | 50 mi. per hr. |
| Rate of climb at ground | 600 ft. per min. |
| Absolute ceiling | 10,000 ft. |

CONSTRUCTION

Fuselage—Welded Chrome Molybdenum steel tubing, fabric covered, no rivets.
Tail surfaces—Welded steel tubing, fabric covered.

Landing gear—Welded Chrome Molybdenum steel tubing, no rivets with 20" x 4" straight-line tires, wheels optional.
Tail wheel—Welded steel tubing spring with rubber disc.

Wings—Spaced apart, dovetail stepped ribs, reinforcing steel tubing struts.
Control system—Standard dual control fitted.
Fuel and oil systems—Gasoline is fed to the carburetor by gravity from a tank in fuselage between seats. The oil tank is located in rear bank of the firewall and ahead of front cockpit. A special scavenging pump returns excess oil to tank from engine.

Stout Publishes Air Transport Booklet

A very attractive booklet entitled "The New Era of Transportation" has been published by the Stout Metal Airplane Co., division of the Ford Motor Co. The book covers the activities of the company in commercial aviation, and also contains much general information on the subject, including the operation of an airplane. It also covers the Ford Model three engine transport with a detailed description of the plane. Copies of the booklet may be obtained from the Stout Metal Airplane Co., division of the Ford Motor Co., Detroit, Mich.



First hours with this ready to land.

any of the French stations. Thus it can readily be seen that when a flyer starts out he knows exactly as well that weather conditions he will encounter and how to avoid them as the meteorologist knows what rains to take and what winds to avoid.

The Weather Bureau is looking forward to the time when each of its stations will be equipped with an airplane in which the observer will make the observations direct and communicate them at once to the ground station. Experiments have been made along this line and they have been very successful. In the near future the Bureau plans to establish six balloon observation stations, and will not far see one operations to establish 10 or 20 more balloon stations.

Each Station a Complete Unit

Each station of the Weather Bureau is a complete unit receiving all reports from the other stations in its section, and making up its own charts according to local needs. Some stations have a direct wire with Washington, but most of them must use the regular commercial channels. Thus the



Front view of the new Driggs Dart II designed by Ivan H. Driggs of the Driggs Aircraft Corp.

American Cotton and American Airplanes

Planes Used on Recent Record Breaking Distance Flights Covered With Cotton Which Has Been the Standard Fabric for Airplanes for Nearly Ten Years.

By GEORGE A. SLOAN
Secretary, The Cotton-Trade Institute

COTTON FABRIC is strong, tough, and unexcelled, being used in the construction of modern American airplanes.

One of the outstanding instances has just been provided by Colonel Charles A. Lindbergh whose splendid flight across the Atlantic from Roosevelt Field, L. I. to Le Bourget flying field near Paris, his third long solo flight with such results in the triumph of the remarkable in aviation.

The result of his flight, completed in the Ryan monoplane, "Spirit of St. Louis," will be felt for many years in aviation, industry, and possible discovery. It is difficult to overpraise the spirit which his victory has given aviation. We are still too close to the milestone than which his achievement stands in the imagination of the world.

From the standpoint of the Cotton-Trade Institute, in which I am personally interested, it is extremely fortunate to have a new interest in aviation aroused at this time.

Cotton fabric was used almost completely in covering Col. Lindbergh's plane. Cotton also in the fabric covering the Bellanca monoplane, "Colubene," and Commander Byrd's three-engine flying "American."

Potential Outlet of Importance

These facts are of great interest to cotton textile manufacturers and cotton planters in the United States as they are so essential to engineers, designers in their plans. From the standpoint of the Cotton-Trade Institute, the use of cotton fabric in airplanes is doubly significant.

In the first place it is an actual and potential outlet of great importance for cotton fabric. It is a considerable percentage that airplanes will soon be made with the cotton textile industry as a large number of cotton. As aviation develops in safety and popularity the cotton industry will need a constantly increasing supply of materials just as automobile and tire manufacturers have taken cotton cloth in its growing volume during the last 25 years. One of the great American cottons for airplane fabric is a short-staple cotton to improve the quality of much of the American crop.

Cotton is one of the intimate necessities of modern life, the universal fabric in the sense that it is adapted to a greater variety of purposes than any other, and yet it is so commonplace that few realize how much and how often it is used. And almost any group of aviation enthusiasts what material is used in covering planes and into the variety of aircraft.

"Cotton" can tell you:

"Metal" from another

"Lemon" from a third

"Oh, Wood" will be another guess.

In aviation, too, are common, for both wood and metal are largely used. As for the fabric covering the "venerable" or metal framework of planes, cotton is now the accepted Government standard.

Learn Quick Before the War

It is interesting to recall that cotton has been the standard fabric for airplanes for nearly ten years. Before the World War there was the complete material. With such a war, but neither then nor now was able to match the first prize of the world. Some of the first aviation engineers cotton in aviation has been told by H. Dana White in a technical report on the structure of airplane fabrics to the National Advisory Com-

mission for Aeronautics in 1926. He wrote in part as follows:

"The third annual report of the National Advisory Commission for Aeronautics contained a progress report on the development of cotton airplane fabrics in which it was indicated that cotton fabrics could be made which would be suitable for airplane fabric, substantiating the fact that previous experiments had indicated that it was impossible to practically synthesize fabric made of cotton. Since that time it had been demonstrated practically that cotton airplane fabrics are satisfactory, and they are giving service results equal to or better than the conventional linen fabrics."

"On report of the National Advisory Commission on Aeronautics the Bureau of Standards, began experimenting with cotton, in January, 1916, to determine the feasibility of substituting cotton for the linen airplane fabric. A thorough study of the properties of the linen airplane fabric has been completed with a view to its general consideration of the substitution of cotton in its airplane wing covering. It was found that while, in 1917, that we were able to make satisfactory for the manufacture of experimental fabrics, which proved to be very satisfactory. The first fabric of this type was prepared in or about the first of April, 1917, and as the same proposed changes were suggested, and during the early part of May, 1917, a fabric had passed the requirements of our laboratory tests. The most important problem was to determine the actual performance of these fabrics. To find out, samples were placed on Army airplanes at Langley Field and on Navy airplanes at Pensacola during August, 1917. Similar fabrics were later sent by the Signal Corps to the Canadian Airplane Co. of Toronto, Canada, and they were placed on airplanes by the middle of October."

Test Proved Fabric Satisfactory

"The results of the service tests demonstrated that the fabric was satisfactory and that service results could be safely predicted in the laboratory. In view of this, we felt justified in changing the structure of the experimental fabric, and the result is the present Grade A cotton fabric."

"On August, 24, 1917, a conference held between the military authorities and representatives of the Bureau resulted in the Signal Corps requesting division ordered that the Bureau of Standards supply the necessary specifications covering the purchase of 500,000 yds. of cotton airplane fabric. The specifications were transmitted by the Bureau of Standards on September 5, 1917, covering the fabric known as grade A and B. A few days later the Bureau supplied the necessary information regarding the appearance and methods of testing and inspecting."

"The Department of Aeronautics was verified to make in further development of cotton airplane fabric, and they began their experiments during September, 1917. In April, 1918, the Signal Corps identified samples which were submitted to be the result of their own experiments. It is understood that the British Government is now using the Grade A fabric with a good degree of satisfaction."

"The progress which manufacturers of cotton airplane fabrics have made during these war years has been outstanding in technical advancement but proceeded more slowly than the war."

Cotton airplane fabric is now made from specially selected Goss Island or Pima cotton, the longest staple and finest cotton grown in this country. Because the supply of this

high quality cotton in United Kingdom is sometimes scarce. As the demand for this rare cotton increases it is of considerable concern to the civil aviation people of this country. Secretary of Agriculture Justice is interested in directing more attention upon the quality of the American cotton crop, so that whatever support comes from aviation in increasing the use of the cotton has a direct influence on the war industry.

In considering the advantages of cotton fabric for airplane covering there are two points which are especially important generally recognized:

- (1) Cotton fabric is light, weighing from 4 to 4.5 ounces per square yard.
- (2) It possesses high tensile strength when subjected to tests of pressure, tear or vibration.
- (3) It is durable and responds well to the application of "dope."
- (4) It is relatively inexpensive.
- (5) It is easily repaired.
- (6) It is available in large quantities in this country at all times. Demand at prices has been limited in the United States only, but in a period of emergency it would be possible to obtain cotton of slightly lower quality.

The cotton fabric used in the construction of Colonel Lindbergh's monoplane was made from 2 1/2 ply that cotton yarn with a count of 80 threads to the inch in both warp and filling. These threads were tested in a tensile strength of at least 80 pounds, and they were further strengthened by the use of the yarn. As a result the finished material in a series of tests has shown an average tensile strength of from 80 to 100 pounds per square inch.

Cotton on the Sikorsky S-348

However wide the gap between the cotton plantations and the wings of a trans-Atlantic flyer, Colonel Lindbergh has so secured the aviation world of this country that it is not unreasonable to anticipate the coming of a day when airplanes will find a wider use for the material, for planes, and as an auxiliary arm of national defense. With cotton such a large American product, the importance of fabric coverings on combat planes has not been overlooked by those in charge of our national defense.

Heavy, large planes may be developed for commercial purposes, using metal or wood more than fabric. At the same time smaller fabric covered planes may do the new airways

of the future almost as constantly as automobiles have occupied our highways.

It is not necessary to be entirely prophetic. Our needs only to be reminded of some of the well known designers who are among cotton fabric to realize the great industrial value. The wings, fuselage and tail surfaces of the Sikorsky S-348, being built for the proposed trans-Atlantic flight of Rene Frenk are covered with cotton fabric which has been finished with 7 mils of pigmented cotton dope. This plane will be equipped with two engines giving a high speed of 140 mph, with capacity for carrying the ordinary world load of at least 10,000 pounds.

Cotton an Army and Navy Plane

In the tropics fabric covered planes built by Sikorsky have been very successful, particularly along a route up and down the Philippine River for the Andrew National Company in California.

The P-18, also known as "The Hawk," which is a standard U. S. Army pursuit plane is entirely covered with cotton fabric. It is the Vought Corsair, a Navy standard two-engine combat plane, and the Curtiss C-1 or Falcon. Fighter planes use much fabric for fuselage and tail surfaces although wings are of wood or metal.

When those areas of cotton are multiplied a hundred fold or even ten fold it will be a day with perhaps more produced cotton on the cotton fields satisfy than on any other manufacturing group contributing its products to aviation.

German Air Traffic Makes Big Increase

Growth in air traffic for the month of April, 1937, shows an enormous increase over that for the same month last year. The German Luft Hansa announces the following operating results for the month of April, 1937, as compared with April, 1936:

	1937	1936
Miles flown	352,800 mi.	287,600 mi.
Passengers carried	3,565	2,566
Baggage	114,800 lb.	112,500 lb.
Freight carried	73,500 lb.	67,000 lb.
Mail and postals	42,300 lb.	26,050 lb.



Five Army planes flying in formation as a part of the recent aerial maneuvers at Kelly Field, Texas.

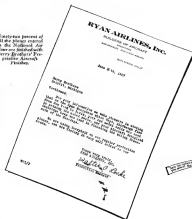
"Well, Here We Are"



Special Photo Courtesy by BERRY BROS.
Reprinted from AVIATION '27

Charles A. Lindbergh

Statement printed at
all the places named
in the National Air
Lines are finished with
Berry Brothers' Pro-
tection Aircraft
Finishes.



Men of great achievement rarely play "hunches". Knowledge is the foundation of their success. They win their battles before they fight them.

It is therefore a fact worth noting that Berry Brothers' Aircraft Finishes—now used by 95% of America's commercial airplane manufacturers—protected the "Spirit of St. Louis", designed and built by Ryan Airlines, Inc., and piloted from New York to Paris by Colonel Charles A. Lindbergh.



BERRY BROTHERS
Varnishes Enamels & Lacquers
Detroit, Mich. (Member of Aeronautical Chamber of Commerce) Walkerville, Ont.

Aviation West of the Rockies

By EARL D. OSBORN

AERONAUTICALLY SPEAKING Salt Lake City is the gateway to the West for it is here that the transcontinental air mail joins with the Western Air Express which goes South to Los Angeles and with the Varney Air Line which heads north to Reno. The airport is situated at the point that valley which lies to the west of the city. The field itself is large enough, but is surrounded

immediately and Salt Lake will be the center point for the new companies' operations. At one time the movement was made both ways and planes orbited at Salt Lake, but with the development of major facilities at Hayward, overhead work was gradually concentrated in Chicago.

Last Fall Lt. Harold Winger took over the reserve efforts training and his certainly done a wonderful amount of work so demanding, serious and arduous. The reserve area comprises Wyoming, Nevada, Utah, and Idaho, and has about 165 active reserve officers. The number of men reporting was supposed to fall near 1,000. Winger took over the operations and he has changed Salt Lake from one of the most inactive to one of the most active of reserve points. Business is great and the country, mostly rough for flying, but by working through such organizations as the Pioneer Heavy Flying Club considerable results can be obtained.

There are two associated commercial operators on the field. Tamm, Thompson, who was an old time barnstormer before he sailed down and R. J. Smart the Englewood doctor. Thompson flies a K8 Oriole and a 180 hp. Hiss Standard, but admits that the OX Englewood is some 15 m.p.h. at the high altitude around Salt Lake. Thompson averages about 15 m.p.h. of flying a week and has solved several obscure cases. A considerable air tool business has been developed in supplying sailing planes. For several years now when the landing system has spread Thompson has been all over the wilderness and come back with his plane loaded with mail.

The Varney Air Line has the Thompson plane when it falls late. The air line company operator Andrew plans



View of part of Salt Lake from field

by high tension wires and during wet weather, planes must stay on the runway or else run the risk of being stranded. The city has begun to realize that the field should be as good as deadlands have been used for that purpose.

The Salt Lake plain has an altitude of over 4,000 ft. and the mountains which surround it run up to over 11,000 ft. The extremes of temperatures are very considerable. In May of this year the thermometer registered 96 deg. one Sunday and when the water poured through the roof heavily there was a heavy snow fall. High winds with great noise and falling air currents are frequent and many planes which are good enough for the plains would be useless in these conditions. Even with plenty of reserve power the pilot must leave him staff for only slight movement or else the plane which is caught in one of the tremendous down drafts.

There are four bases at the field. One housing the government air mail, one the Reserve Officers, one the Western Air Express, and a fourth is shared by "Young" Thompson and the Varney Air Line. At the Boeing Company will shortly take over the San Francisco Chicago line, entirely around the government air mail base is a matter of a standard. Both facilities is still on the job, but reports shortly to go to San Francisco to take over the management of the Western Terminal of the Boeing line. Most of the government air mail personnel will join the Boeing



Some view of the Western Air Express plane

tried with Wright Whetstone engines. This combination gives a quick take off and lots of reserve power qualities which are seriously needed in the mountains. The company has bought a Reeves Wide wingplane and expects to get some more equipment which will have greater speed than the previous. The Varney Air Line after having completed many initial difficulties are now carrying good loads of mail and operating regularly. They operate with a minimum of overhead and instead of trying to build up a vast organization they have put their efforts into the operations of their airplanes. The route of the airline lies over some very rough country and high winds are often encountered. These conditions combined with the altitude found the company to choose the K8 engine originally used and to replace them with the Wright Whetstones. These have functioned perfectly and have given great satisfaction. In winter extreme cold is frequent and difficulty was encountered in getting the engine started. This was overcome by covering the engine and cutting the exhaust leading and under the cover. For lowering the substructure makes a very simple about the device



Air view of the Western Air Express plane

Keeping Pace with the Times



Busby County at Curtis Field

The recent trans-Atlantic flights of Lindbergh and Chamberlin have given tremendous impetus to public interest in commercial flying.

Curtiss Flying Service, Inc. is keeping pace with the times. This "oldest flying organization in the world" has recently increased its operating equipment and is now better fitted than ever to provide all classes of commercial flying service.

Instruction: Special new flying course to qualify students as Reserve Officers. Also standard short flying course.

Passenger Service: Short "pleasure hops" or fast long-distance transportation — at a moment's notice.

Industrial Application: Agricultural dusting, forestry patrol, photographic mapping, etc.

The Curtiss Flying Service, Inc.

Garden City, N. Y.

"Oldest Flying Organization in the World."



has been withheld around the exhaust manifold and a shutter controlled by the pilot allows the air to pass through this if it is desirable.

As the line rose past to Thoro it was some five minutes before the strain on Orville and Washington was released to the value of the air road. Mr. Bell, the traffic manager, has done a fine job in keeping the volume of mail up to the point it has now reached. In view of the difficulties encountered at



Hangars of the Army Corp. of Civ. at Los Angeles

first, many people thought that the line could not be sustained and Mr. Vawter's persistence and successful comeback here was everybody's admiration.

The Western Air Express, which has its Eastern terminus at Salt Lake, Mr. Feltz, stands in no danger and one is immediately impressed by the fact that this organization is run on a business basis. As soon as a plane comes in the mechanics and helper staff a tone of expectation and that the plane is fixed up and before it's put away it is checked up on O. K. for flight. If there is any spare time, it is put in clearing the plane and there is none of the atmosphere of haphazard and haphazard which is an occasion around most hangars. The plane roof was liberally equipped Douglas number to those used by the government or mail. The W. A. E. planes have a considerable amount in the mail section and the tests for passengers can be easily slipped up.

W. A. E. Mean What They Say

On the day that the writer was to fly to Los Angeles, the mail plane from the East was late and it was necessary to wait over and make an early start and morning. When the Western Air Express men so early start they mean it. We were actually in the air by three o'clock. Jimmie Jones was piloting and the air was smooth as velvet without a bump or a bump. There was a fair amount of turbulent air and the more covered mountains on either side of us stood out in bold relief. We had now climbed to 5000 ft. and were on a level with the main fields. A hole descended to the mountain below and high up on the slopes of the mountains were twinkling lights of mining camps. The air was so smooth that we seemed to be suspended by magic while the mountains rolled by below us. It seemed made one feel that it was worth while getting up that early in the morning. Since it was dawn when we were flying, but the valleys were still veiled in shadow. When the sun finally rose, the rolling desert beneath us was revealed in the full force of its barren exposure. The mesas and foothills and long shadows and so far as the eye could reach were streaked of sand, rock, and granite with not a living soul in sight. As the light became stronger a redoubt could occasionally be seen winding its tortuous way down through the valley and across barren plains.

After three hours of flying a stop was made at Las Vegas for gas and oil. When the pilot alighted at Las Vegas the dust beneath us darkened that the pilot takes off by airplane as no landings are visible. Fortunately no wind was blowing on the day that we passed through but the dust stirred up by the propeller was sufficient evidence of what could happen.

After leaving Las Vegas and until one approaches the coast the whole route is over desert country and mountains, but for most of the way there seemed to be flat spots in the valleys in which the plane could glide. The last part of the flight is over a high range of hills and into the little coastal plain known for oil, oranges, and figs. Jimmie Jones landed the big Douglas at the Los Angeles terminal of the W. A. E. shortly after noon, and we got out down to the car for a late breakfast. Throughout the trip one could not help but think of the pioneers who blazed the desolate trail from Utah to Southern California taking seven weeks in a trip which took us less than seven hours.

Aeronautical Matters in State of Change

Aeronautical matters in Southern California seemed to the writer to be in a state of change. One's first impression is that there is a lot of aeronautical activity, but that it is not on a substantial and sound basis. For example on the West side of Los Angeles there are five flying fields within a distance of five miles, three of which are so small as to be dangerous to fly from. There are six or more concerns manufacturing commercial planes in or near Los Angeles, but all of them still seem to be in the experimental stage and the past at least have not reached a real production basis. War surplus planes are still very much in evidence and serve countless occasionally obsolete military firms. There are five or six more. Further investigation shows that conditions are changing. Old firms that had made out a meager existence for years are now able to find backers and financial assistance. New manufacturing firms are being backed by men of standing. The property and change among the actual service operators is shown by the orders being placed for new planes. If one can believe one-third of what is said, the manufacturers are well out far beyond their immediate production capacity.

Spain does not permit giving complete descriptions of the flying fields around Los Angeles. The Western Air Express field is on the inland side of the town at this it has category to fly. It is a well equipped field as far as hangars and repair shops go but it is some two large for planes of the size and high landing speed of the Douglas planes.

The Pacific Air Transport has a small runway field separated from Rogers Airport by a line of telephone poles. To a stranger Rogers Airport is one of the most successful fields in the world. Grasslands is high lands fly around in dozens, machine parts go off in long and sharply pointed tubes, wonder around in odd numbers. The hangars are full of wood planes designed as T-30s or T-31s, and there is a high platform on



Unloading mail from a Vawter mail plane

which perches a good old Jenny. The Kimo may make sense, but the making does not. The Harbor and the Pacific Aero, both have new hangars on their fields and are in a good location to attract passengers. The Harbor Airport has three hangars and does a large business in passenger carrying and maintenance. A new Ryan closed cabin job with a motor and gear was appearing from the field. Jack Lamm, who has recently returned from Alaska, was piloting the plane for J. I.



CLIMB

THE "CORSAIR" official climb in 10 minutes is phenomenal for two-place planes, equalling or exceeding that of Service Single-Sender Pursuit Types, altho such planes are much lighter and carry a much smaller useful load. At 18,000 feet the rate of climb of the "Corsair" is unapproached, and at such altitudes it will outmaneuver and outfly Service Single-Place Pursuit Planes.

CHANCE VOUGHT CORPORATION
LONG ISLAND CITY, NEW YORK

Johnson, the owner. The Duxford school has about 60 students and his school is just over the first of the year.

The Pacific Area today are the experts for Alexander Engineering and specialize in a variety of engines. They have tried to take the field comparatively recently, but they have a few personnel, good working and have extensive plans for the future. The Duxford Airport is quite far out of town and the field is a big one for California, but the equipment is not very elaborate. Flights are from \$1.00 up and maintenance \$1.00 per hour.

Most of the airplane factories are not in Los Angeles proper, but are located in some of its many suburbs. The two factories in perhaps somewhat misleading as the aircraft is so important that no second industry serves the purpose and most of the plants are not very distant. Among the list of



OX welding showing the Delta Industries unit

manufacturing companies in the Kaiser Aircraft & Motor Co. of Glendale, some seven miles east of Los Angeles. Mr. Kaiser built his own plant and taught himself to fly in 1914 and has been building planes in a small shop ever since. Mr. Kaiser tells quickly and from experience about what he is doing today, that about the big things which he is going to do. The factory consists of two adjoining buildings, about 10,000 sq. ft. of floor space. One part of the building is used for storage and maintenance of planes and has a well equipped machine shop in the rear in which the engines are built and assembled. The other half of the building contains the office and the room devoted to the maintenance of the Kaiser Aircraft. Mr. Kaiser down his own drawing and read the shop so that the overhead is low. The floor is a new three plane airplane with a small landing. It is somewhat smaller than most of the OX type planes and is built usually been fitted with Allison or the Kaiser. The first Kaiser engine was flown in the Kaiser and the construction was very successful. The first of the production of engines was being installed in a new structure when the order arrived the factory. Material and parts in the shops for better engines were on hand and by the time several of the engines should have been delivered. This engine and the Allison have been described elsewhere in these columns, so no details will be given here. The workshop in which the engine parts seemed good and much of the design was reminiscent of such light gray engine.

Graduated Active on West Coast

Large Duxford, California is one of the most productive of the Los Angeles branch units, but it also has good and well equipped facilities and a serious amount of manufacturing and a large number of old units. Here a group of local engineers have looked the International Airport. This company was organized the year to just start production the design of its planes. Mr. Fisher is one of the best known commercial designers on the West coast and looked by Mr. Fisher has designed and built a few different types of planes, the Caudron biplane and a biplane with two OX engines being the best known. The present production job is a biplane which may be fitted with either an OX or a larger engine. The de-

signed for the plane has proved so successful that the company has had to move into a larger factory. The new factory has 10,000 sq. ft. and there are about 10 men at work. Some good working machinery has been installed and the plant is on a production basis of two or more planes a week. The plane is essentially built and is designed primarily with safety in view rather than cheapness of production. The company is not a one man concern, but appears to be a real organization founded on business principles and with backing which should lead to expansion.

The main active manufacturing supply shop on the Western Coast is the Crawford Airplane Co. of Venice. Mr. Crawford has a large warehouse filled with almost everything from OX connecting rods to enough military equipment to outfit a motor army. Business was bad Mr. Crawford explained. The trouble is that the demand for aircraft is dropping. Mr. Crawford has ventured from Venice to the Philippines shipping into thousands of war surplus material and still he cannot fit the enormous demands of his customers. Mr. Crawford fits a good production and likes to disappear his good friends. The truth is that war surplus material is getting scarce and the military cannot be expected to sell the old planes. The demand created by Mr. Crawford's list of in Venice was so persistent that it almost worried him to death and he decided that it was worth for him to observe any cost.

Duxford Plant Largest in California

The largest airplane factory in California is the Duxford Plant, which is devoted to the manufacture of military and air transport planes. Its production has been well known and its facilities described here. The factory is located in Duxford, Massachusetts which is a small city about 12 miles from Los Angeles. The plant occupies buildings which were formerly weaving pattern making, and this gives it a rather haphazard appearance. Land has been purchased at Clover Field for the extension of a new factory. At present, the Duxford plant is between jobs and there are only a few over 200 men employed, whereas earlier in the year there were over 600.

Lloyd Stevenson was one of the best known designers of aircraft plants in the world and he is now trying to establish the new sort of reputation in the Western states. He now has his own factory and also a branch at Clover Field. Stevenson completed his construction plans several years ago and on the strength of its performance he has sold several plants. As the design and manufacturing in the Ste-



Los Angeles military wing of the Western Air Express

new planes became better known in the West, they had to give up gradually. Back almost at last year's on to Philadelphia, was, succeeded with Stevenson.

The Bush Aircraft are located in a large wooden hangar at Clover Field. They have built and sold other biplanes and are now at work on a very interesting airplane which will be powered with the Kaiser engine and use Wright Whirlwind. The concern has not as yet gone into quantity production on any of its models and considers the

Oxwelding has introduced sheet metal to the engineer*

ENGINEERS well remember the day when sheet metal equipment was put together with riveted or locked-seam joints. They were either unsightly or flimsy.

Now it is a different story. With high test steel welding rods it is possible to make sheet metal joints that are stronger than the metal itself. This rigid, durable flush type of joint has found wide acceptance in many industries, not only because of its strength but because of its ability to take and hold a finish of baked enamel.

Modern iceless refrigerators, where permanently tight joints are essential, are possible because of the oxwelded joint. The construction of ventilating ducts has been greatly simplified by the flexibility of the oxweld-

ing process. And their effectiveness is increased tremendously because oxwelded joints do not leak.

In the building of automobile bodies and aircraft fuselages, where strength and dependability are vital, are two modern applications of oxy-acetylene welding to sheet metal construction. The strength and finish of the oxwelded joint are more largely responsible than any single thing for the wider use of sheet metal in engineering construction.

Linde engineers have much valuable information on the use of the oxy-acetylene process in sheet metal construction. This information is available upon request.



THE LINDE AIR PRODUCTS COMPANY
440 of Union Avenue and Union Avenue

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10 PLANTS IN — IN ALL AMERICAS

LINDE OXYGEN

* In the list of advertisements in the engineering column of this magazine, welding and oxwelding are the leading words.
"Engineering and Manufacturing Division of Oxwelded Construction"

work which it is doing now as guarantee for larger projects in the future.

San Diego is naturally and justly elated by the success of the Ryan plane with which Lindbergh flew the Atlantic. The success of the Chamberlin-Couesnon air race has inspired the city to give the Ryan Company the heaviest support for day makes while the airplane industry can mean for the city. The Ryan factory is located in the waterfront section of the city near where the proposed municipal hotel will be located. It occupies part of two floors of a good factory



Ryan factory of the Ryan Aircraft Company in San Diego, California.

building and there is space enough for the construction of several planes a week. The woodworking and assembly department are on the upper floor, while the metal finishing is constructed on the ground floor. Mrs. Hall is the chief designer for the company and Mr. Edwards the chief mechanic. Mr. W. H. Blevins is in charge of factory production. Mr. McKelvey, president of the company, was away at the time of the writer's visit. As a result of Lindbergh's flight many orders had been received, and the shop was being reorganized to take care of the increased demand.

The Royal Prerogative Company is also located in San Diego. The plans developed by Mr. Russell seem to be similar with very favorable recognition. As one model is made of cloth, which is cheaper than oil, and as the fabric is very simple, the prototype should become popular among commercial pilots.

George Padden, who was formerly an Detroit with the Ford Airplane division, was beginning to install equipment in a factory which will manufacture dashboards, nacelles. As Mr. Padden was barely under way it is too early to make comment on his product.

Fires Not Yet an Active Factor

Of course, the big thing romantically speaking about San Diego is the Naval Air Station. Planned towards the end of the war and commencing with funds appropriated at that time, the station is a model which it is hoped will be followed in other places. The buildings are substantially completed and well designed and the grounds are kept up as well as can be. The place looks splendid. The plans include a museum and various other facilities were completed and Capt. H. R. Doyle, who most kindly showed Townsend Lindbergh and myself around, seems to have a very high opinion of the station. The army air base at San Diego is located on the beach quarters and there is a general feeling that the army will ultimately take over the whole of the Naval Island. At present the army base is used more as a repair and storage depot than as a flying field.

Although San Francisco is the Western terminus of the transcontinental air mail line and the operating center for the Pacific Air Transport it has not as yet developed into an active aeromedical center. The city is active in the way of a big passenger and recently during the summer a heavy fog rolls in almost every evening. Every flight in the air mail terminates and it is also used by the Army. It

is located on the water edge near the Golden Gate and is recommended for any pilot who wishes to practice flying in fog. Pilot textbook of the P. A. T. has installed a fog here on his Whirlwind Travel Air. The student can be brought through the haze and the results are sometimes startling. It is said that it can be used through five miles of fog (it never does in California) whereas only a few thousand feet of fog will blanket out the nose of the Whirlwind, textbook states that when the fog is fog bound, he flies above it and knows the student a predetermined number of times to tell them on the ground when he expects to land. Accordingly he can have a check going to his friends along the coast.

Seeking Field Further Inland

The municipality is seeking a field further inland and the Boeing Company here a field quite a ways from town. The only airplane factory in Fresno is the Ryan-Will Co. which is building a Whirlwind airplane cabin plane. One of these has been successfully tested and is now in use by the Varsity stadium. Another formerly with the Aircraft Development Corporation is now organizing a company to manufacture metal planes.

Californians are apt to be boosters and enthusiasts but the growth of the state has shown that their aspirations of today is many times become the reality of tomorrow. Up until recently California has been the last strong of war surplus planes, it has been the home of record pilots flying from small fields and no California manufacturer of commercial planes has as yet reached a steady and large production line yet Southern California's home of being the most active aeromedical state in the nation is already in part true. There are many planes in the state and they do a lot of flying. There are probably more commercial designers and manufacturers in Southern California than in any other part of the country. A writer gathers the impression though that there are too many firms and that value shaped the other too low for real profit. Power factories with larger production and better looking for factory would put motion on a number business here.

A good start has already been made towards a number here in flying in California. The public is beginning to demand modern planes and the large capital and replacement cost of new equipment tends to reduce the number of irresponsible firms. Everywhere there are amazing adequate



"Fog" used at Ryan field for more work.

used fields. Manufacturers are getting substantial financial benefits and as there is a real demand the more competent factories will soon be on a production basis.

The per capita of planes in California is and will continue to be large. In spite of early morning coastal fog the weather is mostly excellent, there being few violent storms and no cold winters. The country itself is not by any means ideal for flying for though there are many long valleys the greater part of the country is simply making an actual aeromedical. Due to the fog and the small amount of sheltered water there is little prospect for the use of airplanes.



THE compelling reasons which dictated the choice of Hoffmann Roller Bearings for crankshaft service on record-making flights should inspire fliers everywhere to specify bearings, as well as motors, of the same reliability.



And, where dependability is just as essential, the fact that more modern and costly (as with the Foster-Roth Industries Company) engines specify



In both open and closed types, in the range of size loading up to 1000 lbs. on the bearing duty for which "HOFFMANN" are so well adapted.

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The great cost of shipping planes to California will help the manufacturers of planes for local use, and there are many other reasons why substantial airplane factories should grow up on the West Coast. Southern California is mostly built up on kerosene oil and the aviation industry but it is only gradually developing any manufacturing.

One form of aeronautical activity which is about sure to start in California is the development of passenger carrying airlines for the tourist trade. Southern California is the



How big have to be included in a plane

far from the center of population than any other of America's aviation centers and passenger carrying lines would do much to encourage the tourist trade.

It is hard for Americans to realize that it is as far from Texas California as Southern Texas as it is from Florida to Maine and it is hard for Westerners to realize that the total population of the whole West Coast does not equal that of New York State. Outside of Southern California there is little aeronautical activity with one big exception and that is the Boeing factory in Seattle. The writer recently was greatly surprised at the size and layout of the plant. With one exception there is no airplane factory in the country which can compare with it in modern buildings and for the use and the completion of its manufacturing equipment and facilities. At the present time there are a total of over seven hundred men working in the plant. The engineering department alone has over 60 employees. The work of the plant is split up among ten departments. As much as possible another work such as the making of drawings, drawing of wires and other surfaces is confined to one building, the welding is done in another and wiring, painting and plating are done in a third. The buildings are of modern construction of glass steel and brick and are thus be easily expanded. By this system the work was handled in an orderly fashion and it is sure to check up on it before it goes into the final assembly plant.

Boeing Planes at Santa Point

Santa Point is the Naval Air Base for the Northwest of the United States. It consists of a narrow bayfront with some beautiful grass trees on one side and a telephone line on the other. There are a couple of small houses and a small garage. The house has been added in appropriate form for the improvement of the site and probably do so in the next season; it certainly should. On the left however was a sight which would bring a thrill to anyone interested in aeronautics for a dozen years. Boeing and planes were lined up the edge of the quays and there certainly did look new.

The planes are fixed with Pratt & Whitney Wasp engines and the combination gives a most business-like but graceful appearance. These planes were sent to a group of 15 with which the Boeing Air Transport Co. will operate the Chicago-San Francisco Air Line. The detailed finish of the planes both inside and out is excellent and of jobs and specifications count the planes should have a fine performance.

In spite of the national sales which have two passengers the Wasp has a very speedy landing engine.

The general conclusion to be drawn from a trip to the West Coast are on the whole most encouraging. There seems to be real design ability and that year for perhaps the first time there is a large demand for modern types of commercial planes. With these two all important factors present it should not be long before one or more of the Western aeronautical factories get on a production basis and begin to make some money.

The development of the air mail route throughout the West is most encouraging. The scheme of mail carried has increased steadily and has needed a point where most of the lines at least are in a regular form. Although the density of the population is not large as compared to that in other parts of the country, the demand is so great that much time has been spent and the people have realized that the air mail is of very great value to them and there will be an even greater use of air mail and an extension of the present number of lines. The number of cities which are requiring airports is making inclusion of the growing interest that is being taken in them and there is every indication that there will be an extension of the present system of air mail.

The manufacturers are beginning to realize the value of airports and manufacturers will focus about the need for airports on land. The construction of these various factories should produce good results and one can prophesy a healthy growth in the aeronautical industry on the West coast.

Dusting Planes Delivered to Canada

Two combination dusting airplanes have been delivered to the Department of National Defense of the Canadian Government by the Keystone Aircraft Corp. of Wichita, Pa., to be used for dusting wheat and also for dusting of spruce forests in spruce forests.

These two planes combine such as themselves a land plane, a sea plane, and a fighter with provisions for the easy removal of the dusting apparatus and the substitution of a machine gun and machine, adroitly, either in the front or the rear cockpit or in both. The planes are equipped with Wright "Whitcomb" engines, the same in type and design as used by Col. Charles A. Lindbergh in his flight from New York to Paris.



Frederick Paul Schuler, of Oakland, Calif., delivered the first such of such to Pioneer Park who delivered the first to the United States by the Keystone Aircraft Corp. of Wichita, Pa. The first such of such to Pioneer Park who delivered the first to the United States by the Keystone Aircraft Corp. of Wichita, Pa. The first such of such to Pioneer Park who delivered the first to the United States by the Keystone Aircraft Corp. of Wichita, Pa.



WRIGHT WHIRLWIND MOTOR

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Here is an airplane that gives more performance per horse power than was ever thought possible — a plane built for passenger comfort — a plane containing all of the most simple and positive controls.

No plane at any price gives you as much performance and safety factors — WACO is engineered to withstand a power range of 90 to 250 horse power safely.

We will demonstrate and prove it to any dealer who comes to our factory.

WACO
AIRPLANES
MANUFACTURED BY ADVANCE AIRCRAFT CO., TROY, OHIO

N.A.T. Planes Flown Over 700,000 Miles During First Year of Operation

(Cont. from page 32)

ed. The usefulness of the maintenance and overhaul work is shown by the fact that 10,000 sq. mi. was flown past toward the end of the year.

The first year of the N.A.T. operation on the Chicago-Dallas route has been as satisfactory as could be expected. Traffic has been somewhat larger than was anticipated and the percentage of scheduled flights completed has been excellent. Two major points which held out great possibilities for

colled that they wish to do this. With a steady increase in traffic already demonstrated, with great possibilities opened up by the night schedule and by the new Trans Air planes the N. A. T. goes into its second year of operation of the Chicago-Dallas route with every prospect of success. The opening of the Chicago-New York route which the N. A. T. will also operate will greatly reduce the overhead and will allow other economies in maintenance and purchases. It is to be hoped that what has been accomplished so far is only an indication of what will be done in the future.

Goodyear Gets Airship Design Award

The Board appointed to appraise the designs entered in the Airship Design Competition, 1927, recommended the award of the first prize to the Goodyear-Turner and Robins Co. of Akron, O., for the complete design of a rigid airship capable of carrying five airplanes and equipped with engines sufficient to drive it at a speed of 50 m.p.h. This airship is 750 ft. long and 135 ft. in diameter with a volume of 4,000,000 cu. ft. The primary purpose of this airship is to operate with the fleet.

The Board further recommended an award of \$5,000 as reward prize for the purchase of the design submitted by W. W. Watson, Pages of Baltimore, Md. The design consisted in first test and then given favorable mention was that submitted by Dr. Johannes Seelinger of Straßburg, Germany. A list of about 27 designs and ideas was submitted in the competition and were awarded and shared according to their merits.

The proposed airship is to be about two and one-half the volume of the Zeppelin which has the longest will be only about three percent greater and the diameter about fifty percent greater. All of the knowledge gained through the operation of the Zeppelin and the Shenandoah will be reflected in the construction of the new airship. Studies already made and still being made on the Zeppelin will be of invaluable assistance and warrant full confidence in the successful design and construction of the airship which will be completed before the two new rigid airships are completed.

The expense matter of the airship is not with such reasonable bottom cost, under various conditions, service for several hundred and even of about six officers and men will be about 10,000 standard miles at 50 knots or about 6,000 standard miles at the maximum speed of 70 knots. 5000 standard miles per hour. The time necessary to construct the air ship will be about three years.

Army Dirigible to Make Long Flight

The War Department has announced that personnel has been granted to the United States Army Air Corps dirigible No. 1, at Scott Field, Bolling, Md., to make an extended flight to the East and return. The flight will be by way of the country personnel in supervision and monitoring of the dirigible on an extended journey, to test facilities for handling dirigibles at army airfields and to test the performance of the R-51.

It is proposed that the dirigible ground from Scott Field to Langley Field, Va., to make a landing about 100 miles, the day being placed in a hangar for inspection and servicing prior to departure for Bolling Field, D. C., next day. Bolling Field plans provide that the ship proceed to Lakehurst and be landed for servicing. On the following day it is contemplated to continue the journey up the East Coast with a view to the possibility of going as far north as Boston by way of Mitchell Field, New York.

The return journey probably will be by way of Lakehurst for servicing, after which the ship will proceed up the Hudson River by way of West Point and the Mahwah Valley to Buffalo and on to the large station at Scott Field. The R-51 is the army's largest dirigible.



Front section of the new Trans Air airplane being used on the N.A.T. mail run. Note excellent visibility features.

the future have been brought to light. The first is that the establishment of a night service would greatly increase the volume of traffic and the second is that a lighter and more economical plane can be used to good advantage on this route. Looking arrangements are now completed on far north as Wichita and as far south as Cincinnati and the Department of Commerce expect to have the whole route lighted by late summer at which time the night service will begin. The lighter plane has been based on the Trans Air airplane, powered with a Wright Wheland engine. The Trans Air was built



Viewing the approaching light on the new Trans Air in the N.A.T. service.

according to N.A.T. specifications for its mail service. It is inherently stable to a stable degree and not a very maneuverable. In a fog the pilot could let go of his stick and he would only have to transfer occasionally to stay on the course. Vision is excellent and the pilot though relieved may easily make an emergency exit. The Trans Air being other plane, passengers can be carried but the N.A.T. has not definitely de-



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Airplanes Aid in Flood Relief Work

In a report recently issued on the use of airplanes in flood relief work, it is stated that the first trips were made to assist the United States Government engineers survey the extensive waters from levees at the Arkansas River levees. This led to an increase in the dams of engineers at Monroe, La., and in taking possession in the nature of building a levee against the back-water, which eventually saved the city from inundation. Planes were also used in saving lives by spotting successful floatings in the path of the oncoming flood and in finding routes for boats to take to upland isolated habitations.

Following the first rush in trying to save stranded people, there arose the problem of bringing typhoid cases, children to combat malaria, diphtheria and other strains to the refugee camps which were cut off from any kind of contact of communication. Also, it is pointed out, surgeons and physicians and nurses had to be brought to these camps to perform major operations and to attend maternity cases.

First Flight Made in a Half-Delux

When the flood came was first noticed Navy and Army planes were ordered to give assistance to relief work over all other activities. Since the early stages of the flood, two weeks, Fla., has been entirely closed to other aerial activities and the entire force has been turned over to help overcome the danger zones. Both Navy and Army planes, and pilots of individual companies are reported to have been of the greatest assistance in flying over the stricken areas with supplies and in reporting the condition of various refuges. While the Army and Navy planes were making it easier to do the work of flood relief, civilian and military owned planes were the only medium on hand capable of reaching survivors. J. C. Belmont, Chairman of the Quenchit Ferry Division of the American Red Cross, reports that during the period they were called upon to use every possible means for the preservation of human life in the area surrounding Monroe, there were no government planes available for use in reconnaissance work and in the direction of boat operations for rescue work.

The first flight made in a Half-Delux plane, Mr. Belmont states, was such that it gave the government engineers at Monroe a very definite idea of what effect the break in the Arkansas River at Fordville would have on this area. The flight made possible the necessary preparations for the relief which was needed and was at Monroe.

The 10th Observation Squadron, Arkansas National Guard, commanded by Major Anthony W. Woodson, operated from Little Rock to Memphis and over the surrounding territory. Of the stricken planes of the Army Air Corps used in flood relief work, the De Havilland, piloted by regular air corps officers, were sent to Little Rock to co-operate with the National Guard. Four Army training planes (Cessna) the air corps training center in Texas were also assigned to relief work.

Practically All Load Planes

Lt. E. F. Herndon of Bolling Field piloted the only airplane plane equipped in the relief operations. Lt. Herndon has been away from his to night hours each day, carrying the officers of the Reserve Corps on inspection trips to various flooded areas and locate levees in levees. Earl Feltz of Half-Delux Division has been making from one to four trips daily to Delta and other points with doctors, medicines, medicines, etc.

Practically all planes used in flood relief work, it is stated, have been load planes. If any mishap occurred they were in great jeopardy of being lost and on anything but good reasons of possible damage to the water.

In the work of establishing in the great swamps and cotton growing country of the Mississippi Valley airplanes are expected to perform a great deal of work. It is expected that after the waters have receded, there will be considerable work

in which mosquitoes will breed and that a large scale mosquito campaign will have to be initiated to control the spread of malaria. For this purpose it is proposed to use planes again in reconnaissance work and in finding possible mosquito plague by means of finding the flooded areas with their dams.

Flies From Fairbanks to Point Barrow

A Beechcraft airplane, piloted by Joe Cronin of the Fairbanks Airplane Corp. of Fairbanks, Alaska, recently completed the first cross-country flight from Fairbanks to Point Barrow, Alaska. In five flying days Cronin piloted his plane over a formidable mountain range and across the wide plains of the Arctic slope to Point Barrow, among them the coast of the Arctic Ocean, over a snow-covered plain, to Kotzebue, hopped to Neruk and then struck a easterly course back to Fairbanks. The most dangerous part of the flight was over the Endicott mountains where it



Map showing of the route flown by Joe Cronin of the Fairbanks Airplane Corp. to Point Barrow.

was necessary to maintain an altitude between 6,000 and 8,000 ft. over country that offered no place to bring a plane down in case of a forced landing. The distance was 1,000 mi. in 17 hr. 20 min. flying time.

A. M. Smith, correspondent for the Detroit News on the Detroit News-William Expedition was Cronin's passenger on the flight. Confronted with the necessity of making arrangements for transportation to Point Barrow when it was found that the Alaskan Detachment, belonging to the expedition, were carrying a greater load than that estimated, Smith suggested with the Fairbanks Airplane Corp. to have Cronin pilot him to Point Barrow.

The flight was completed without incident in spite of the fact that the weather was less than ideal.

Colonel Lindbergh to Tour Country by Air

According to a recent announcement Col. Charles A. Lindbergh will start an airplane tour of the United States under the auspices of the United States Department of Commerce.

Colonel Lindbergh will pilot his own airplane the "Spirit of St. Louis," in which he successfully completed his record New York to Paris flight. He will start very shortly and cover the entire country. It is expected that his nationwide flight will take two or three months, during which Colonel Lindbergh will visit some of the principal cities in the United States. The entire undertaking will be financed by the United States Department of Commerce.

Twelve Years of Pioneering in Aircraft Motor Development 1915-1927

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These Packard achievements are not mere coincidence, but are the well earned result of twenty-seven years of leadership in power plant engineering.



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FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions,
Bureau of Foreign and Domestic Commerce

Aviation Development In Frankfurt

Frankfurt was a leading city in developing the air transportation system in Germany. It is a junction point of European routes, and only one of 10 in 1935. It is the only city requiring Frankfurt is superior as a German aviation center. Frankfurt holds 30 per cent of the capital of the Luftfahrt Nachrichten A. G., a subsidiary of the national air service company (Luft-Hansa) and which represents the parent company at Frankfurt.

Last year the city formed an aviation field company, (die Flughafen Gesellschaft), to represent its interests in providing terminal facilities for the air transport company. The capitalization was fixed at 45,000 marks. The city guaranteed an interest-bearing loan of 300,000 marks to the company, which was able to secure additional non-interest-bearing loans from the National and Prussian Governments. The company manages the aviation field, guards the craft, provides repair and communication facilities, and weather and signal services. It is expected that within a few years an airport on the investment will be secured.

Of the total subsidy paid to the lines operating at Frankfurt, that city pays 25.50 per cent, while the National Government provides 52.24 per cent, the state of Prussia, 18.86 per cent, and other sources, 7 per cent. The city contributes largely to local services, while most of the international services are met by the National Government.

During the last quarter of 1937 new services were started between Frankfurt and Paris, and between Frankfurt, Amsterdam and Cologne.

Some of the main reported services are on the following routes: Frankfurt-Erfurt-Berlin, Essen-Cologne-Frankfurt-Munich, Frankfurt-Paris, Frankfurt-Strasbourg, Frankfurt-Bonn, Frankfurt-Gesam-Grand-Haven, Cologne-Paris, Frankfurt-Darmstadt, Frankfurt-Mannheim-Heidelberg, Frankfurt-Cologne-Düsseldorf, Frankfurt-Bonn-Amsterdam, Frankfurt-Munich-Basel-Geneva, and Frankfurt-Schweikheim-Potsdam.

Belgium to Make Brussels an Airport

The Administration of Aeronautics of Belgium plans to transform the Brussels commercial aviation field at Evere into a modern airport.

The layout of the field is to be considerably increased, and a modern light tower, a radius of action of 50 km. installed. Plans include new hangars to provide shelter for eight large commercial planes.

Waiting rooms, customs office, and telegraph and telephone stations, are planned. A system just for broadcasting and for receiving is also to be installed, replacing the present installation which have an inefficient range.

The Brussels-Paris route will be further at Aéro, Grand, Brévy and Orly. The Paris-Brussels route will also be further at Aéro, Grand, Brévy and Orly. The Paris-Brussels route will also be further at Aéro, Grand, Brévy and Orly.

Stockholm Air Harbor Improved

The air harbor in Stockholm, Sweden, has been improved and now has a hotel and restaurant of its own. The harbor has been made quite up-to-date by the construction of a special concrete pavilion and new landing platforms. A new house the will be built. The State Meteorological Institute will furnish a report to each airplane upon its departure.

Postponement of Danish Air Show

The Royal Danish Aeronautics Society was forced to abandon its plans for holding an international strength exhibition last August, owing to the lack of Danish participation. The show was, however, then taken up again as the initiative of Captain Eriksen-Jensen and a committee has been formed to take definite action. The exhibition which is to be held under the auspices of the show society, but under the financial guarantee of the committee mentioned, is scheduled from Aug. 20 to Sept. 2, at Glast Hill, Roskilde Air, Copenhagen. A preliminary program of the exhibition and air traffic regulations will be printed. An international meeting is also contemplated in connection with the exhibition in order that the factories may have an opportunity to demonstrate the performance of their machines.

Nantes To Have Airport

Preparations for the establishment of an airport for Nantes, France, at Beauvais, two miles southeast of the city, have been made. The proposed undertaking, a joint one of the Aero Club de l'Atlantique of Nantes, the Chamber of Commerce of Nantes and the French War Department, includes the construction of from two to four hangars and the installation of mechanical equipment for repairs, re-fueling facilities, etc. The port is expected to serve as a terminus for a route to London by way of St. Malo and the Channel Islands, and it will probably be connected with Bordeaux, which will be a terminus for a Paris-Paris-France route. The project is being made to put the new air field into operation during the present year.

Airplane Factory At Combar, A. R.

A national airplane factory, which will cover an area of about 1,000 acres, is being built at La Combar, Argentina. Construction work on the various buildings is progressing rapidly and the plant will begin the manufacture of planes by the end of August, 1937. It is announced that fifty planes of the Aero type, with dual controls, will be made first and used as training planes for the air forces. The majority of the aircraft from Buenos Aires to La Combar is also announced, to be effected as soon as the new plant is in operation.

Santiago-Volaparaire Air Mail

Daily air mail service between Santiago and Valparaiso began May 3 and is to be maintained by the Compañía de Aeronavegación. Mail and one passenger are to be carried by the single plane, a Morane-Saulnier monoplane of 180 hp. Experiments with larger planes are planned in Puerto Montt in the South and to Azores. The plane leaves Santiago at noon, arriving at Valparaiso about 40 minutes later, and returns at 5 o'clock the same day, thus making 215 hours in and transmission in either direction.

Airborne At Rouen, France

Forty acres of land have been purchased for an airbase at Rouen, France. The Municipal Council of that city voted \$50,000 francs for the purpose. The land occupies the military field of Rouen, which with the new property, will give a total space of more than 130 acres for aerial maneuvers.

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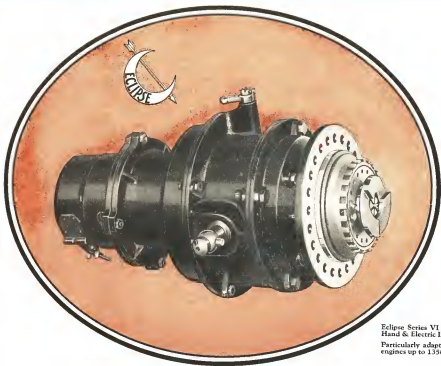
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